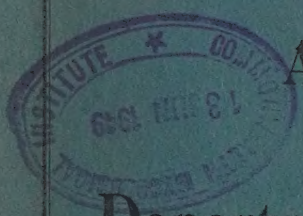
COLONY OF MAURITIUS



Annual Report

of the

Department of Agriculture

1947

[PRICE : R. 1]

PRINTED AND PUBLISHED BY
J. ELIEL FELIX, GOVERNMENT PRINTER
PORT LOUIS, MAURITIUS
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Policy of the Department of Agriculture

The policy of the Department of Agriculture is, and must continue to be, based upon the most efficient production of sugar, the crop which is best suited to the vagaries of Mauritius soils and climate. It is becoming increasingly evident, however, that subsidiary agricultural industries must be developed, not only to support the main industry, but also to provide a means of livelihood for an evergrowing population confined within the narrow limits of this small island. Land not suited for efficient production of sugar must be developed in other crops, and plans must be made against a possible eventuality of limitation of sugar production by international agreement. Two crops with which considerable developments are possible are Mauritius hemp, produced from *Furcroea gigantea*, and tea, both of which crops can be grown in areas unsuitable for sugarcane, the former in dry districts without irrigation and the latter in the very wet cool districts.

Tobacco is another crop which is grown on a limited scale at the present time, but unfortunately there does not seem to be much scope for development in the near future, as the locally produced leaf is only suitable for home consumption and it is unsuitable for export on account of the " tang ". The cost of production is high.

Efforts are also being made to increase local food production, and with this object in view a Food Production Board has been established. It is encouraging to note that the efforts of the Board have been attended by some success, and that the system of planting bonuses for some selected crops, and a guaranteed price in addition for maize and earthnuts have resulted in increased areas under these crops. All fresh vegetables required are produced locally, but it is felt that even larger areas of these could be planted with advantage. Mauritius, with its droughts and cyclones, limited area and dense population can never become self supporting in the matter of food-stuffs, but with increased research and continued efforts, there seems to be no reason why it should not become less dependent on outside sources for some of its food requirements.

Another method by which the food supply of the island may be improved is by improving the milk supply, which is very short at the present time. This improvement will depend upon several factors, many of which require much more investigation than they have so far had.

The year 1947 will probably go down to history as the year when agriculture was the subject of more enquiries by overseas advisors than any other. In the first instance Mr. C. C. Webster, S.A.O., Nyasaland, visited the island with the object of investigating the possibility of cultivating tung oil on an economic basis. Later Mr. Lock, O.B.E., S.A.O., Tanganyika Territory, and Mr. P. W. Lees of Messrs. Robey & Co., England, surveyed the Fibre Industry, on the agricultural and mechanical sides respectively, and have submitted reports containing their recommendations for its improvement, and finally but not least the Mauritius Economic Commission, which has investigated not only agricultural problems, but also many other aspects of vital importance to the economic welfare of the Colony.

Many of the senior officers of Department of Agriculture have been busily engaged on various committees of the Commission and there is no doubt that the amount of departmental work performed during the latter part of the year was reduced in volume because of these activities of the senior officers. The Plant Pathologist, Mr. P. O. Wiehe, was seconded for duty as Joint Secretary from 1st July until the end of the year, whilst others were engaged in almost daily meetings during the months of November and December. Although the volume of work during the year under review was of necessity reduced, there is no doubt that their work with the Commission will pay a handsome dividend in the years to come.

The staff position throughout the year has been very unsatisfactory, with some posts vacant and many others being occupied by officers holding acting appointments. Mr. G. E. Bodkin, C.B.E., proceeded on leave prior to retirement in March, and his successor was not appointed before the end of the year. Mr. N. Craig, Officer-in-charge, Sugarcane Research Station, who was appointed Deputy Director of Agriculture as from 1st, July, acted as Director of Agriculture for the rest of the year. The Sugarcane Research Station was also sadly depleted of both senior and junior officers, as was the Veterinary Research Station, in which no appointments were made to the two senior posts of Animal Husbandry Officer and Veterinary Pathologist. Many of the divisions were also understaffed. In the circumstances therefore, it is not surprising that the amount of research work performed had had to be reduced. This reduction of research work at a time when it is vitally important to the future well-being of the Colony is much to be regretted, and it is to be hoped that 1948 will see a definite strengthening of the staff.

The Sugar Industry

Varieties. As has already been mentioned, sugarcane research work has had to be seriously curtailed because of lack of the necessary staff. Nevertheless, sugarcane breeding was maintained at a high level, because of its supreme importance to the industry. Although no new varieties were released for general cultivation during the year, it is confidently expected that some varieties will be available during 1948. Some varieties raised by the Manager of Highlands Sugar Estate were introduced into trials for the first time, but it is too early as yet to pass any opinion on these varieties.

The varieties introduced from Trinidad in the previous year have now been released from quarantine and have undergone multiplication to such an extent that a series of trials have been started with them to test them prior to their release being considered. Further varieties have been introduced from abroad, and are now being grown in the quarantine greenhouse. These varieties are CP34/120, CP.36/13, and CP.36/105, Q.28 and the Hawaiian variety 32/8560. It must be emphasized that the chief object for the introduction of cane varieties from abroad is to extend the range of the breeding programme, with the subsidiary object that a good commercial cane may also be obtained. There is always a risk however, that cane pests and diseases may be introduced, and in order to minimize it as far as possible, arrangements have been made for the erection of a new quarantine greenhouse, part of the cost thereof being defrayed by the Sugar Industry Reserve Fund.

The chief variety, M.134/32 now occupies about 80 per cent of the area under sugarcane, so that the economy of the island is now almost dependent upon this one cane variety ; this constitutes a situation which is not altogether satisfactory, in spite of the fact that during the year under review it showed itself to be resistant to the major cane diseases and pests present in the Colony. It is therefore imperative that no effort should be spared to raise new varieties capable of replacing M.134/32 in case of necessity. Some varieties nearing the completion of their testing period may be released during 1948.

Insect Pests and Diseases

The position with respect to the major cane pests, white grubs and cane-borers—remains the same. Infestations of white grubs were heavy in certain parts of the island, and, so far, no practical method of control has materialised. Experiments have been started to test the effectiveness of DDT and gammexane as Agrocide 7 and Agrocide wettable powder, but no reliable results are yet to hand. The effect of paradichlorbenzene dissolved in an equal weight of carbon bisulphide was tested in a further series of experiments, the results showing that there was a definite decrease in the number of larvae in the treated plots. No new parasites of the white grub were imported during the year.

An entomological mission was sent to Madagascar to collect parasites of the spotted borer (*Diatræa sacchariphagus* Bojer), but due to the unsettled conditions obtaining these, the work was severely hampered. As a result of this and other difficulties, only 237 adults of *Euvipio rufa Szep.* were received alive. These were liberated in three colonies, situated in close proximity to another in a heavily infested area in the north of the island. Two flies, *Lixophaga diatræae* Tors and *Paratheresia clarifalpis* Wulp. were also imported from Trinidad by air with the object of combatting this pest. From laboratory investigations, the Lixophaga appear to be the more promising, and unfortunately fewer fles of this insect were received than of the other Both these flies have been liberated in areas where the incidence of borer attack is high.

During the years 1944 and 1945, when destructive cyclones affected the island, the main cane variety suffered to some extent from Red Rot disease, and fears were expressed that the M.134/32 might succomb to it. Experience during 1946 and 1947—cyclone-free years—has shown, however, that this variety is not nearly so susceptible as had been feared, and that, under normal conditions, there is no danger of heavy losses being incurred due to this disease.

In general there has been no serious outbreak of disease in the growing cane. Research work has shown however, that the dipping of cuttings in a solution of Aretan has a very valuable effect in reducing the incidence of pine-apple disease of cuttings and furthermore that aretan has a stimulating effect upon the growth of young shoots, resulting in larger yields. The use of this organo mercurine compound is becoming common on estates, and its use should become universal for all cane plantations throughout the Colony.

The amount of sugar produced during 1947 amounted to approximately 348,700 tons, a quantity which beats the previous record figure by nearly 19,000 tons. Rainfall during the growing period was below normal, but well distributed, and with no destructive cyclone, the cane made steady growth, with the result that the total cane tonnage was much above that of the previous year. The extraction figure, 12·45 per cent. was much above the previous record of 11·8 per cent. and may be accounted for by the fact that the canes remained upright, and also by the good maturing season. The results of this crop indicate that the average rainfall of the island in more than is necessary for good cane growth, on condition that it is well distributed. There seems little doubt however that the water reserves in the deeper layers of the soil have been severely depleted, with the results that crops will be more susceptible to drought until these reserves have been fully restored.

The agricultural side of the sugar industry was very fully investigated by Committee No. 1 of the Mauritius Economic Commission, under the chairmanship of Mr. R. R. Follett-Smith, and this committee put forward various recommendations for the future welfare of the Industry. A target figure of 400,000 tons was put forward for the annual crop, and although it seems not unlikely that this figure may be reached for any one year, it seems improbable that the average annual production could reach it. The most immediate method by which the crop could be increased to this figure is to increase the yield of small planters' canes. At the present time the yield of canes from small holdings is only about half that from lands belonging to estates with mills, and although the planters' yields are never likely to reach the same level as that of planters, due to a higher proportion of the less productive lands, there is no doubt that considerable improvement can be effected fairly rapidly by means of education and demonstration. Provision has been made in the Development and Welfare estimates for one Senior Field Demonstrator and six Field Demonstrators to be appointed to the Sugarcane Research Station. Up to the present, only three of the latter have been appointed, and their work has been hampered to a certain extent by their inability to find housing accommodation in their districts. However, useful work has been done, and with the appointment of the full staff, it is to be hoped that results will soon become evident.

The Sale of Canes Control Ordinance, No. 47 of 1941

The report on the working of the Central Board which administers the above ordinance is included for the first time in the Report of the Department of Agriculture so that it is necessary to give a brief description of its objects.

Before the setting up of the Central Board in 1939, there was much uneconomic competition on the part of the millers for planters' canes in certain areas, resulting in very high prices being paid, whilst in others, planters were disatisfied with the payment received. Millers were allowed to purchase cane at comparatively big distances from the factory, so that transport costs were higher than they would have been, had the cane been delivered to the nearest factory.

The two-fold object of the Ordinance was therefore—

(a) to define the area from which any mill must buy all the sugarcane grown within the area allotted to it, and

(b) to ensure that the planter obtained a fair price for the cane which he supplies to the mill in whose area he is situated.

The Board is constituted as follows—

Director of Agriculture—*Chairman*.

Two representatives of the millers.

Four representatives of the planters, of whom two shall be planters producing less than 1,000 tons of cane per annum.

In the case of any dispute which comes before the Board, only two of the planters' representatives shall take part in the vote, the usual procedure being that in the case of a dispute between miller and small planter being heard, then the small planters, producing less than 1,000 tons of cane are designated by the Chairman to take part in the vote. The big planters take part in the vote where a big planter's concerns are under investigation.

Regional committees are also constituted to try to settle disputes by agreement without their coming before the Central Board.

The guiding principle in determining the payment due to planters as stated in the Ordinance is that " the average amount of sugar which planters might expect to receive for their canes would not be less than two-thirds of the amount of sugar which a ton of such canes delivered at the factory might normally be expected to yield." With the large numbers of small planters supplying canes to the mills, it is impossible to analyse each small planter's canes, so the policy adopted has been to consider all their canes in one factory area together and to work on their average sugar content. Payment is not based on the one year sugar content, but on an average of five years. The necessary analytical staff is employed to carry out control work at the various mills.

The question of transport has been a burning one, and has given rise to many disputes between the different parties, and to much discussion by the Board which is hampered in its work because of the lack of a properly qualified accountant. Part of the planters' canes is delivered at the factory, and part at weighbridges which are situated at varying distances from the mill. This cane is carried by the mill's tramway systems, the cost being recouped from the quantum of sugar allotted to the planter. In view of the

large distances over which some of the cane has to be transported, the Board considers that it would be impossible for these planters to bear the whole burden of the cost of transport themselves, and has therefore adopted a telescopic scale, in that the planters delivering canes at the factory yard are made to bear a certain proportion of the cost of transport of planters' cane delivered at distant weighbridges. There are arguments both for and against such a scheme, but the Board has adopted it so far in the absence of any other scheme which would be better for the sugar industry as a whole.

Another point which has caused a certain number of protests is that the average extraction figure for five years is used in assessing the quantum of sugar to be paid per ton of cane. Naturally this point only arises in years of good extraction, but no protests are registered when the extraction for the year is less than the average of the five-year period. The reason for adopting the five-year average was to protect the planter against violent price fluctuations. In this connection, it is necessary to emphasize that very low extraction figures are often recorded in bad cyclone years, when field yields are also low. This last point is now of less importance in view of the establishment of the Drought and Cyclone Insurance Fund.

In spite of these points, it is generally admitted that relations between millers and planters have improved since the inception of the Central Board, and the decisions of the Board are generally accepted without complaint. There must be occasional cases of hardship, but the Board makes every effort to take exceptional circumstances into consideration when assessing the amount of sugar to be paid in special cases. In general, the working of the Central Board has resulted in bringing more order in the sugar industry by eliminating uneconomic competition, arranging factory areas as far as possible to supply an adequate quantity of cane to each mill with the least transport possible, and by ensuring that the planter is paid a fair price for his cane.

The detailed report by the Registrar of the Central Board given in Appendix 3 describes the work done during 1947, and much credit is due to the staff of the Central Board Division, and especially to the Registrar, for the work performed. As stated earlier, the post of Accountant is still vacant, in spite of many efforts having been made to secure a suitable candidate. The lack of this officer is a source of constant worry to the Board.

The Fibre Industry

The Aloe Fibre Industry, which is produced from *Furcræa Gigantea*, is very closely associated with the Government Sack Factory, which at present processes practically all the fibre produced.

In 1946, the production of the fibre had fallen to such an extent (710 tons) that it was impossible for the Sack Factory to work on a two-shift basis. During 1947 however, production had been stepped up to nearly 1,000 tons, so that by the end of the year the stock of fibre in hand and the prospects for the 1948 crops warranted arrangements being made to re-start a two-shift basis in 1948. In view of the probable difficulty of securing sufficient jute bags from India, this is a very valuable asset, and in order to increase still further the amount of sugar which could be contained in locally made bags, the size of the bags was increased from 55 kilos to 80 kilos holding capacity.

Practically all Mauritius hemp is produced from wild growth, intermingled with scrub growth, of which *Cordia macrostachya* is one of the chief. As a result the cutting and transport of leaf is expensive, as is also the extraction of the fibre from the leaf which is performed by antiquated methods, demanding skilled labour. From the wild growth now in the island, it is estimated that the annual production could be about 1,200 tons of fibre, which is just sufficient to keep the present Government Sack Factory running on a two-shift basis. The bags thus produced would only be sufficient to bag about one-fifth of the local sugar crop, and therefore for the whole sugar crop to be put into sacks manufactured from local fibre, about 6,000 tons of aloe fibre per annum would be required.

With the object of stepping up production to this extent, therefore, Messrs. Lock and Lees visited the island, and their findings show that in order to achieve this end, it must be produced by plantation methods and that it will be necessary to construct an efficient automatic decorticator with a capacity of about one ton dry fibre per day. It is also recommended that the fibre should be produced from *Furcræa Gigantea* and not from Sisal, which does not appear to thrive so well under local conditions as does the *Furcræa*, and the fibre from which is not suitable for processing in the Government Sack Factory.

The chief difficulties in the way of agricultural development appear to be—

(a) Competition from the main crop—sugarcane—in that all the best lands in the fibre belt which are capable of irrigation are taken for sugar. This competition is likely to increase when the Mare Longue reservoir and further irrigation works in the Black River district are completed.

(b) The large numbers of large stones and boulders which cover the surface of much of the land suitable for fibre production, rendering mechanical cultivation difficult. It is thought, however, that the use of bull-dozers or angle dozers will obviate this.

(c) Scrub growth, of which *Cordia macrostachya* (herbe Condé) is one of the most noxious. Experiments are in progress in the Entomological Division and in the Sugarcane Research Station with the object of controlling and/or eradicating this pest. Parasites are being introduced from Trinidad, and one of these, Schematiza, a leaf eating insect, appears to be adapting itself to local conditions, whilst the possibility of using weed-killers is also being explored. It is necessary to realise, however, that there will be no quick solution to this problem and that at present its control will lie rather in the cultural methods than in biological control or the use of weed-killers.

With fibre production on plantation lines, it is estimated that the yield may be in the neighbourhood of one-half ton per arpent, so that it will be necessary to have 12,000 arpents producing the crop to satisfy the total requirements of the island. It will take several years before production can be increased to this extent, and the capacity to process the fibre must keep pace with production. According to Mr. Lock's report, 7,000 arpents will be the maximum area which can be put under this crop. It may be possible, however, to find some uncultivated portions of land on sugar estates suitable for it.

The fibre mills mostly rely on the old fashioned raspador but there are some automatic decorticators of three makes working. None of these machines is considered by the adviser to be efficient, and consequently it will be necessary to design a new automatic machine capable of producing about one ton of dry fibre per day. There is little doubt that this is the first necessity for any large scale development, as at present about one-half of the cost of producing fibre is due to the extraction from the leaves. It is hoped that an efficient decorticator which will turn out clean fibre without the necessity for retting will be evolved.

There is no doubt that the initial preparation of the land, the actual planting and maintenance of plantations up to the time of bearing will be costly and it will be necessary before embarking on such a scheme to ensure a reasonable market for the fibre when it is produced. As no plantation fibre can be produced for about three years, it is impossible to predict what price the fibre would fetch on the world market. A domestic market for the fibre to make sugar bags, and some form of agreement with the Sugar Industry to use these bags would appear to be the best solution. There is no doubt that there should be close liaison between the two industries, and should the status of the Sack Factory be altered, then the suggestion that it should be made into a Co-operative factory in which both fibre and sugar producers are interested, should be considered. In order to encourage closer relationship between the two industries it might be possible for the sugar estates to plant fibre on lands not suitable for sugarcane, and for the fibre so produced to be processed at the Sack Factory at a fixed rate per ton, the bags to be returned to the sugar estates. The work on cultivating, cutting and preparation of the fibre could be performed during the slack season for sugarcane. This would have the advantage of ensuring more regular work to labourers on sugar estates, and so conserving the supply of labour necessary for peak periods, even in spite of extensive mechanization of the Sugar Industry.

In view of the many difficulties to be overcome energy and determination on the part of all interested will be necessary ; if, as is to be sincerely hoped, they can be overcome, then the fibre industry should become a very valuable asset to the Colony, conserving capital and affording employment to many people during the slack season of the year so far as the sugar crop is concerned.

Tea Industry

The tea industry was investigated by Captain de Mowbray, D.S.O., R.N., (retired) in 1946, but unfortunately the Tea Officer, who was appointed in October 1947, did not arrive until early 1948. Consequently little progress was made in implementing the recommendations made in Captain de Mowbray's report, and final decisions regarding policy were delayed pending the arrival of the Tea Officer. Arrangements were made however for the visit of a member of the International Tea Marketing Committee to advise on methods for increasing the consumption of tea in the island, and he is expected to arrive in the island early in 1948. There is much scope for development in this industry, suitable land is available in healthy districts, but it will be necessary to arrange housing accommodation in this area which is sparsely populated.

Conditions for the growth of tea throughout the year were satisfactory, and in addition a fair amount of work in some plantations to improve their condition was performed. With the arrival of the Tea Officer in the early days of January, 1948, it is expected that considerable development will take place in the near future.

Livestock

Although provision was made in the General Estimates 1946–47 for the appointment of an Animal Husbandry Officer and a Veterinary Pathologist, no appointments had been made up to the end of 1947. Consequently it was impossible to embark on an all-out drive for the improvement of live-stock in the Colony.

There is little doubt that much development is possible and necessary, particularly with respect to milk cattle and poultry. At the present time milk is in short supply and generally of poor quality, and from a nutritional point of view, the question of improving it is the most urgent necessity. This will involve not only the grading up of the present milk cattle, and increasing their numbers, but also improving pastures and methods of management. The present staff of the Veterinary Research Station is inadequate to meet all these demands, in addition to continuing their administrative and lecturing duties.

Pure bred Friesian bulls have been stationed at various centres in the island, with the object of improving the milk breed. If it was found that a bull was not being used sufficiently in any one locality, then efforts were made to secure another station where it would be more effective. In all, approximately 1,000 cows were served during the course of the year, so that when the calves come into milk production, some effect should become apparent, experience at the Government Dairy having shown that milk yields of the half-bred Friesians are generally distinctly better than those of local breed. Efforts are also to be made to increase the rate of grading up by the use of artificial insemination.

Milk production at the Government Dairy showed a welcome improvement during the course of the year, but a disturbing factor arose in December. Abortion has, for many years, caused losses at the Dairy, sometimes very severe. Examination of fœtuses in the Bacteriological Laboratory, and of blood samples both here and abroad, had failed to reveal the causal organism, although a steptococcus was suspected as being the cause of the trouble. There was only one case of abortion during the year, and the examination of the fœtus revealed the presence of *Brucellus abortus* (Bax), so it may well be that this organism has been the cause of this trouble for many years. This question is now under active consideration, and for the time being, the sale of stock from the Government Dairy to other breeders has been suspended.

With the exception of the appearance of contagious abortion in the Colony, the disease position remains unchanged, no case of trypanosomiasis being recorded throughout the year. Spraying with D.D.T., or with Vitix

was found to be efficient against ticks, so that this will be a useful method of control where dipping facilities are lacking, and where cattle are allowed to graze in the open.

It is generally agreed now, that the raising of beef cattle for local consumption will be uneconomic and that the provision of meat should be subsidiary to that of milk production, being obtained from the unwanted males of the milk herd and from females culled from the herds.

It is estimated that 25,000 milk cows with improved milking qualities will be sufficient to provide 200 cubic centimetres of milk per head of population. With this number of cows and with the larger carcase weight due to grading up by use of Friesian bulls, much more meat from home sources should become available for local consumption. It is to be hoped that the Land Settlement Scheme will be of great value in this connection, both for meat and milk production.

Tobacco

The post of Government Tobacco Officer remained vacant throughout the year, so that the work of Tobacco Research Station at Richelieu was conducted by the Senior Research Assistant assisted by a Research Assistant, both employees of the Tobacco Board, under the general direction of the Director of Agriculture. Progress in the raising of new varieties and selection work was made, but obvioulsy the range of work attempted had to be reduced. Sufficient seed for all the 1948 plantations in the Colony was saved from selected plants of the various varieties of tobacco, and a limited quantity of seed obtained by crossing Amarello with Bonanza was produced for trial on planters' lands. This cross had been shown to be superior to either of the parent varieties for yield and grade index.

A considerable amount of work has been performed with respect to resistance to the Black Shank disease of tobacco, which, on occasions, can cause considerable losses. Crosses between the cigar wrapper variety Rg and flue curing varieties have shown increased resistance to this disease, but further work is required to secure a new variety suitable for flue curing.

The tobacco produced in the Colony, during 1947–48 amounted to over 400 tons, a quantity in excess of manufacturers' requirements, so that stocks which had been severely depleted during the war years were built up to a certain extent. In general the grade index was better than for many years past and this was, in many cases, due to a better supply of fertilizers. Superphosphate was available for the first time for some years, and there is little doubt that this form of phosphate fertilizer is better for tobacco than is phosphate guano.

There were several plantations which were suffering severely from potash deficiency, which become most marked fairly late in the vegetation cycle, so that it could not be then corrected. It should be noted that the yields of

leaf per acre are very high when compared with the yields in countries producing high quality tobacco, and it may well be that the method of cultivation employed, which results in high yields, is one cause for the poor flavour.

It is evident however that much more investigation is necessary before high quality tobacco, with a good flavour can be produced in Mauritius. So long as the leaf produced is only suitable for local consumption, the tobacco industry must remain a minor one, although it is valuable in that it keeps much money in the Colony, and it also provides a fair amount of work for people incapable of performing the heavier work in sugarcane.

Weed Control

Mention has already been made with reference to the control of *Cordia macrostachya* by means of biological control, which investigation is in the hands of the Entomological Division ; parasites of this pest are being sent by Dr. Simmonds of the Commonwealth Bureau of Biological Control, who is working in Trinidad on behalf of this Colony. Shipments of insects are received by air, and are tested for their feeding habits locally, and finally bred and released.

In addition to this work, the Sugarcane Research Station has continued its valuable work on the use of weed-killers. New forms have been tested, and compounded mixtures have also been tried with promising results. The full application of the results already obtained is difficult because of the shortage of necessary spraying equipment and of weed-killers. This method of weed control is, however, rapidly gaining ground, and there is no doubt that when supplies become easier, it will find very wide application. Even under present conditions, large areas heavily infested with Herbe Bol *(Hydrocotyl bonariensis)* estimated at between 3,000 to 3,500 arpents have been virtually freed from this weed by means of hormone weed-killers. This is a considerable achievement as this weed is very difficult to control and the cost is high.

Food Production

Every effort is being made to increase local food production, and with this object in view, a Food Production Board, under the chairmanship of the Honourable Mr. A. L. Osman, O.B.E., has been established. Planting is entirely voluntary and planters are encouraged to plant more by the payment of bonuses and the fixing of guaranteed minimum prices for certain crops. There is no doubt that the efforts of the Board have attained a certain measure of success, and that many people are becoming much more ' food-minded ' than previously. The Department has made its contribution to this work by means of propaganda through the Agricultural Officers and Agricultural Instructors, by means of short talks broadcast over the Mauritius Broadcast System and by providing planting material of high standard of various crops, such as vegetable seeds, fruit trees, etc. This activity of the Department is being extended.

In view of the acute shortage of oils and fats, plans were formulated during the year for greatly extended plantations of earthnuts, which had only been grown on a small scale for direct consumption. Unfortunately the supply of seed of the two varieties best suited for local conditions, viz., 'Cabri' and 'Tennessee' Red, were too small to allow of their being planted on a large scale, so that 200 tons of Virginia Bunch were imported from Uganda. All seed from the former two varieties is to be kept for future plantings.

New crops are constantly being tried to reduce the degree to which the Colony depends upon outside sources for its food supply. It is realised that it cannot become independent, but it is not unlikely that a much larger proportion of its food could be grown in the island, without materially affecting the main crops, particularly sugar. This would include the growth of field crops for feeding to animals and poultry, as both these classes of stock need considerable development.

General

The individual reports by the Heads of the several Divisions of the Department of Agriculture are given in Appendices 1–12.

These reports show that investigations have covered the whole field of agricultural operations in the Island and that useful progress has been made, and I would like to express my appreciation of the loyal and hearty support which I have received from all during the year.

Relations between the Department and the planting community in general have, as ever, remained friendly and cordial, and the thanks of all the members of the Department are due for the willing assistance always given by the planters.

18th April, 1948.

N. Craig,
Acting Director of Agriculture.

Order of Appendices

1. Statistics.
2. Sugarcane Research Station.
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Appendix 1

Statistical Division

1. Meteorological Conditions

From the meteorological standpoint the year under review was characterized by lack of rainfall during the greater part of the growing and maturing seasons. In the high rainfall localities, however, precipitations have, in all probability been sufficient for growth requirements.

Temperature was also deficient throughout most of the year, the means for only three months, namely, January, May and July being above normal.

Precipitations proved short during the first quarter of the year, especially in March, the deficiency in rainfall developing into a drought in certain localities of the Island. Unsettled weather conditions prevailed during that period due to the occurrence of distant cyclones. One of these was of moderate intensity and its centre passed at about 110 miles South-South-east of Mauritius, towards mid-February, wind velocities of up to 58 and 60 miles per hour being recorded at the Aerological Station, Vacoas, and the Department of Agriculture, Réduit, respectively. All the other depressions were of low intensity in so far as the Colony is concerned.

Beneficial rains occurred in April and June, but rainfall was below average in May and July, especially during the latter month. The growth conditions were favourable during that period, particularly in the Northern districts and partly counterbalanced the ill effects of the drought experienced during the previous months.

The cool and dry weather prevailing throughout most of the maturing season has been very favourable to cane ripening: temperature was generally below normal and rainfall deficient.

The drought experienced all over the Island in November was broken by abundant and well distributed rains falling mostly in the first fortnight of December as a result of which the 1948 crop had a good start.

2. Sugar Production

The total cane crushed amounted to 2,800,483 metric tons, as against 2,530,324 in 1946. Cane yields have been, on the whole, above anticipation and have generally been running high.

The maturation process was favoured by ideal meteorological conditions and the sucrose content of the cane has accordingly reached a very high level, the highest on record. The extraction of sugar per cent of cane has been above all expectations: the average figure for the factories being 12·45 per cent as compared with the previous maximum of 12·1 per cent in 1943.

The total sugar manufactured amounted to 348,531 metric tons and is also the highest on record: this figure exceeds the previous record by nearly 22,000 metric tons.

The proportion of the various grades of sugar was the following—

Raws	319,386	thousand metric tons
Granulated whites (vesous)... ...	29,047	..
Lows	98	..
TOTAL ...	348,531	..

This years's record crop can be ascribed to the following main factors—

(1) Exceptionally favourable maturation conditions.

(2) The high proportion of virgin, first and second ratoon canes reaped in 1947.

(3) The high percentage of the cane variety M.134/32 under cultivation in the Island.

(4) The exceptionally favourable growth conditions experienced in November, 1946, temperature having been above normal, and well distributed and usually abundant rains having been received all over the Island during that month.

(5) The favourable growth conditions in June and July, 1947, particularly in the North.

3. Area Under Sugarcane

At the beginning of 1947, the area under sugarcane was estimated at 140,2 05 arpents (146,235 acres), of which 102,815 acres belonged to estates with and without factory.

The replanting of cane in food-crop lands has been pursued, so that the total acreage in cane has increased during the year and has, in all probability, reached the pre-war figure.

4. Sugar Market and Disposal of the Sugar Crop

The exportable sugar crop was purchased by the Ministry of Food of His Majesty's Government.

The total sugar exported during the 1946–47 year (1st August, 1946, to 31st July, 1947), was 269,345 metric tons which included 1,513 metric tons from 1945–46 crop. The amount exported between 1st August, 1947, and 31st December, 1947, was 196,972 metric tons which included 11,111 metric tons from the previous crop. These figures include shipments to the Dependencies.

The apparent local sugar consumption in 1946–47 was 19,293 metric tons.

5. Importation of Agricultural Machinery and Fertilizers

In 1947, machinery to the value of Rs. 2,173,578 was imported and tramway material to the value of Rs. 1,372,487. The importation of farm tractors, ploughs and parts amounted to Rs. 682,320 in value.

A total of 20,247,366 kilograms of chemical fertilizers valued at Rs. 5,714,971 was imported during the year.

6. Tobacco

During the year under review 435,279 kilograms of tobacco valued at Rs. 756,210 were produced consisting of—

	kilos
Flue cured	293,741·5
Air cured	141,537·5
TOTAL ...	435,279·0

Rodrigues' production amounted to 258·1 Kilos valued at Rs. 353.48.

The area under tobacco in 1947 was 616·94 arpents as follows—

	Arpents
Flue cured	453·79
Air cured	163·15

The amount of leaf tobacco used in manufactures was—

	Kilos
Imported	93,692·5
Local	330,643·8
TOTAL ..	424,336·3

7. Fibre, Coconut, Groundnut and Tea

Fibre. The following was produced by the Sack Factory in 1947—

55 Kilo bags	735.241 units
80 Kilo bags	13,027 ,,
Filter press cloth	66,416 yards
Other clothes	4,777 ,,
Yarn (for local rope manufacture)	38,821 kilos

940,074 Kilos of fibre and only 153 Kilos of sisal have been received at the Sack Factory during the year.

79,977 Kilos of fibre have been exported from the Colony in 1947 for a value of Rs. 45,159.

Coconut and Groundnut. No coprah or coconut oil was exported in 1947. The quantity of edible coconut oil produced by the Innova Factory during the year was 1,017,888 Kilos, as against 518,529 Kilos in 1946.

Tea. The total acreage under tea in 1947 was 1927 arpents (2,010 acres) while the total tea production amounted to 504,559 pounds.

8. Livestock

The importation of cattle for meat purposes from Madagascar amounted to 6,942 of a value of Rs. 1,904,392 and 451 heads from Rodrigues. Besides the following were imported from Rodrigues—

3,655 goats, 1,942 sheep, 2,932 pigs.

350 live sheep were received from Australia for meat.

4 sheep from Australia and 12 from South Africa were also imported not for food.

The total bovines on estates at the beginning of 1947 was 8,879 head as compared with 9,693 in 1946.

9. Alcohol

The quantity of alcohol distilled in 1947, was the following—

	Litres
For industrial purposes	2,196,705
For human consumption	1,086,458

The export of rum amounted to 5,522,417 litres valued at Rs. 1,169,833.

In all 11 distilleries were in operation in 1947.

A. DE SORNAY,
Statistician.

Appendix 2

Sugarcane Research Station

The year 1947 saw the most critical staff shortage that the Station has yet experienced. Following the appointment of the Officer in charge as acting Director of Agriculture and the resignation of the Assistant Chemist, the Chemical Division of the Station had no staff during the year. The transfer of the Geneticist to British Guiana left the Genetical Division with only the Assistant Geneticist. The Botanist has been acting Officer in charge of the Station. Two additional Field Demonstrators for extension work among small planters were recruited during the year, but most of these officers' time was employed in helping to carry out the normal research programme of the Station. The whole of the remaining staff of the Station have made their utmost efforts to maintain the more important lines of the work in progress.

Fortunately the arrowing season was a very favourable one for crossing purposes and practically all the crossing work planned at the beginning of the season was carried out successfully. None of the Barbados varieties recently imported from Trinidad flowered so that it was not possible to carry out the planned breeding work with these varieties. A total of 205 crosses were made and germination of the fuzz was on the average very good although it was noted that there was a pronounced drop in fertility in those crosses made towards the end of the flowering season.

The initial advantage of obtaining vigorous seedlings in the pot stage was to some extent negatived by a forced delay in the planting-out programme owing to the failure of the water supply and the general shortage of water in the reservoirs resulting from drought conditions. From a total of 61,310 seedlings obtained, 6,686 were planted out at the Central Experiment Station Réduit, 6,883 at Pamplemousses Experiment Station and 9,493 at the New Station in Plaines Wilhems (on the boundary of Upper Côte d'Or and Hermitage).

The usual first year selections were made at Réduit and Pamplemousses—the average number selected being 1·5 per cent. of the number of seedlings planted. Selections at the Plaines Wilhems Experiment Station are to

be made in July–August 1948. A further 1·5 per cent. was selected from ratoons—selection from ratoons is now routine practice as it has been found to be a very profitable method. The full number of second, third and field trials were laid out for the progressive testing of virgin and ratoon selections, and field trials have in addition been laid down to test the varieties imported from Barbados and to test certain varieties bred locally at Ebene (Highlands Sugar Estate).

Of the seedling selections on which exhaustive tests have been made two varieties show considerable promise. These are M.213/40, and M.423/41. Further information on these varieties is necessary before their release for commercial propagation can be contemplated.

The following varieties imported from overseas are now planted in the quarantine greenhouse—the Canal Point varieties C.P.34/120 C.P.36/13 and C.P.36/105, the Queensland variety Q28 and the Hawaiian variety 32–8560: all these have been successfully established.

The twenty factorial experiments on fertilizer application laid down by the Chemical Division were maintained. They were harvested in the 1947 season and the appropriate fertilizer applications were made. Leaf samples were taken and stored for subsequent analysis. The basic purpose of these 3N × 3P × 3K factorial experiments is not only to obtain data on the response to the major fertilizing elements in the different climatic regions of the Island, but also to extend the data on which the Foliar diagnosis technique which has been established as of great value in the determination of the nutrient status of the growing crop under Mauritius conditions, is based. Analysis of the 1947 leaf samples will therefore be made as soon as the staff situation permits.

In so far as the yield responses of these trials are concerned, the response to Nitrogen has been considerably higher in first ratoons harvested in 1947, than the corresponding response in Virgins (Plant canes) harvested in 1946. The comparative data are as follows—

PERCENTAGE RESPONSE TO NITROGEN PHOSPHATE AND POTASH

	0N	*1N*	*2N*	*0P*	*1P*	*2P*	*0K*	*1K*	*2K*
Virgins ...	100	112	113	100	98	98	100	102	103
First Ratoons ..	100	130	133	100	101	101	100	103	104

It is evident that large increases in yield result from the application of Nitrogenous fertilizers in particular to ratoons and that the single dose of Nitrogen (30 Kgrms. of Nitrogen per arpent) to ratoons is practically sufficient to cause maximum response, there being only a further increase of 3 per cent. by increasing the dosage to 60 Kgrms. of Nitrogen. A high fertility level of phosphate and potash exists. No significant responses to phosphate were obtained in any of the individual trials in ratoons and only two trials gave a significant response to potash. The trend of the mean data for all the trials, however indicate that as successive crops are taken, responses to potash and phosphate will finally become apparent.

Work on the control of noxious weeds has been continued in the Botanical Division. Further information has been obtained on weeds for which preliminary data only were previously available and the influence of climatic and environmental conditions and stage of growth of the most important weed species on their reactions to chemical herbicides has been ascertained. In addition the work has been extended to weed species on which data were not previously available. Various compounded and activated herbicides have been extensively tested and a range of new herbicides which became available during the year have been used against weeds species hitherto difficult to control. A practical programme of weed control by chemical means has been worked out, but it must be emphasized that the spraying equipment at present available in the Colony is inadequate for extensive weed control. It is estimated that 3,000-3,500 arpents infested with Herbe Bol (*Hydrocotyle bonariensis*) have been practically freed from this weed by the use of the hormone herbicides in the Island during 1947. This is a considerable achievement with the spraying equipment available. If chemical weed control is to become standard practice, however, a considerable decrease in the cost of making the applications is necessary and to ensure this, adequate spraying machinery must be made available.

Co-operative research between the Botanical Division of the Station and the Plant Pathology Division of the Department of Agriculture on the use of organo-mercurial compounds has given results of great practical value. Not only has the effect of these substances on pine-apple disease incidence and mortality been carefully investigated but their effect on the production and growth of young shoots has been followed and the effect of the treatment on yields at harvest ascertained. The protection from Pine-apple disease and the stimulating effect of the organo-mercurial product Aretan, has been outstanding and yield responses of 3-4 tons per acre have followed the use of this substance. It is already widely used for preplanting treatment of cuttings and there is no doubt that its use should be universal under Mauritius conditions.

Investigations on the fertilizer value of crushed basaltic rock have been initiated both by field experimentation and by means of pot-experiments. A carefully planned $3 \times 2 \times 2$ factorial experiment is designed to test the effect of nil, 91 tons and 182 tons per acre of rock dust in all combinations of two levels of fertilization and with two varieties. The first series of pot experiments have shown that the rock dust supplies an appreciable amount of available potash but itself supplies no phosphate. In the presence of phosphatic fertilizer considerable quantities of calcium and magnesium are also absorbed from the rock dust. Further experiments are also in progress to determine whether there is any response to trace elements contained in the dust. At the same time field experiments have been laid down to test the effect of supplementing additions of magnesium and various elements on the yield and sucrose content of cane grown on the poor highly leached soils of the wet districts

Subsidiary investigations were made on the vegetative propagation of Eupatorium pallescens a food plant for Scolid parasites. It was found that difficulties in rooting cuttings of this plant were due chiefly to excessive loss of moisture before rooting was initiated and to rotting of the basal end of the cutting. Pretreatment of the basal end of the cutting with 1·0 per cent. aretan followed by instantaneous dip of the whole cutting in melted paraffin wax was found to be very effective and strikes of 80-90 per cent. of the cuttings planted were obtained.

Some preliminary experiments were also carried out on the preservation of sugarcane pollen. By storage at 0°C and 85 per cent. humidity the pollen can be kept viable for 3-4 days: although germination is frequently obtained in artificial media for longer periods than this, pollen preserved for more than 4 days gives very few or no seedlings when used for crossing male sterile varieties.

Acknowledgement is made here for the loyal co-operation of the staff of the Station, of Estate managers and Planters and of Commercial firms who have supplied us with free samples of herbicides etc., which has greatly facilitated the progress of the work

H. Evans,
Acting Officer-in-charge,
Sugarcane Research Station.

Appendix 3

Central Board

In 1947 the Central Board was set up with the Director of Agriculture, as Chairman and the following members—

Millers' Representatives	Mr. A Wiehé, factory manager of Labourdonnais Sugar Estate. Mr. E Julienne, Manager of Réunion Sugar Estate
Big Planters Representatives	Mr. P. Lagesse of Eau Bleue Estate. Mr. M. Souchon of Espérance Estate
Small Planters Representatives	Mr. O. Dookun of Solférino. Mr. Dewkoomar Reetoo of St. Julien d'Hotman.

In March, the Director of Agriculture, Mr. G. E. Bodkin, left the Colony on leave prior to retirement and the Ag. Director of Agriculture, M. N. Craig, was appointed Chairman of the Central Board. During the same month Mr. Souchon left the Colony and was replaced by Mr. A. Martin of Belle Vue Estate.

Staff

Registrar	J. R. Avice, A.R.T.C. (Glasgow) Dip. Agric. (Mauritius).
Accountant	*Vacant.*
Acting Assistant Registrar and Chemist	C. Mayer, B. Sc. (Eng.) (Rand) Dip. Agric. (Mauritius).
Assistant Chemist	J. Galéa, Dip. Agric. (Mauritius).
Investigational Officer and Weighbridge Inspector ...	L. Colin.
Senior Test Chemist	S. Belcourt, Dip. Agric. (Mauritius).
Clerks	N. Chelin. M. Pitchen. R. Dada.

The Registrar spent two months in South Africa to investigate certain aspects of the Sugar Industry. During his absence, Mr. C. Mayer acted as Registrar.

2. The following is a *résumé* of the work accomplished during the year.

A. Meetings of the Central Board

The Board held 18 meetings. The main business dealt with may be summed up as follows—

3 meetings relative to applications for changes of delimitation.

2 meetings relative to assessment of planters' sugar.

6 meetings relative to protests against assessment of planters' sugar as worked out by the Board.

1 meeting relative to cost of transport of canes by tramway.

1 meeting relative to dispute between miller and planter re: settlement of canes.

2 meetings relative to a case in appeal against a decision of the Board.

1 meeting relative to the compulsory installation of automatic devices for weighing juices and imbibition water in factories.

1 meeting relative to the closing down of cane weighbridges.

1 meeting relative to general business.

B. Registration of Cane Contracts

6,030 cane contracts relative to 30 factories were registered during the year.

C. Delimitation of Factory Areas

26 applications were received for changes of delimitation of factory areas. In 11 cases the requests of the applicants were granted. As a result of the closing down of Alma and Beau Séjour Sugar Factories, the lands formerly forming part of those factory areas have been included in Mon Désert and Mon Loisir factory areas respectively. Towards the end of the crop seven planters, who had not finished their crop at the same time as their respective factories, were allowed to send the balance of their canes to their neighbouring factories for manipulation.

D. Sugar Factory Licences

Previous to the beginning of the crop, permits were issued to all factories and new plans were supplied to those factories whose areas had been altered.

E. Permits to Middlemen

29 permits were delivered during the year against 32 in 1946, 34 in 1945 and 60 in 1940.

F. Investigations

77 investigations were carried out by officers of the Board relative to the delimitation of factory areas and to disputes between millers and planters. Many disputes were settled amicably. Relations between Millers and Planters have been very good during the year. This may be attributed to a large extent to the price obtained for the sugar and to the record crop obtained which have brought a feeling of satisfaction to both parties.

G. Control of Cane Weighbridges

163 weighbridges dealing with planters' canes have been tested during the year under review. On first inspection 99 weighbridges were found to be in good working order and accurate. 39 weighbridges were found to be inaccurate and 23 weighbridges were not in good working order. Of these, 57 were found accurate at the second examination, 5 had to corrected and two had to be re-examined a third time. Two obsolete weighbridges which had been condemned in 1946 have been replaced by two weighbridges in good condition. During the crop, 237 surprise checks were carried out at the various weighbridges and 395 vehicles which had been previously weighed were re-weighed. In 392 cases the weight recorded in the weighbridge books were found to be correct. In three cases the weight recorded did not tally with that found by the Weighbridge Inspector and the responsible weighers were prosecuted. 50 check tests were performed at the different weighbridges. Only one weighbridge was found to be slightly inaccurate and the necessary repairs were immediately effected.

H. Sucrose Content Tests

The cane testing service again experienced a very busy year. Six temporary assistants were employed during the crop so that altogether three chemists and six cane testers worked on planters' canes. 2,112 sucrose content tests were carried out in 24 factories compared with 1,838 in 1946 and 676 in 1945. The problem of securing the services of test chemists is becoming very acute. The method of cane analyses devised by Messrs R. Avice and S. Staub was again used with very satisfactory results. With the widespread distribution of the single variety M.134/32, it is believed that, after statistical examination of the figures obtained, it will be possible to simplify the determination of sucrose content of canes with the result that planters' canes could be tested more often.

The number of planters asking to be paid on the basis of the two-thirds of the extraction have considerably increased ; a few factories have decided to enter into provisional contracts with all their planters. For the first time a full-time cane tester was stationed at a factory and it is probable that a similar step will have to be taken for a number of other factories in future.

The improvement in quality of planters' canes, small planters in particular, was again very definite, and the planters' produce compared very favourably with that of the estates. On an average the amount of sugar per ton of canes given to planters was 2 kgs. more than in 1946. The richer varieties now grown, the more rational cultivation and the greater interest shown by the planters are welcome contributions to the progress of the sugar industry.

Cane testing went on smoothly ; a fair amount of work had to be done at night and in general the estate authorities very willingly co-operated.

Following the recommendations of the Registrar, consequent upon his visit to South Africa, the possibility of requesting all millers to install scales for weighing mixed juice and imbibition water is being considered by Government. Such a step would considerably improve the chemical control of factories and consequently lead to more accurate figures of sucrose content of canes.

I. Cost of Transport of Canes

The cost of transport of canes by tramway in Mauritius was calculated as usual. The average cost per ton mile for the 1946 crop was 81 cents as compared to R. 1.25 and 91 cents for the 1945 and 1944 crops respectively. The drop in cost for the 1946 crop may be attributed to the large tonnage of cane transported, the cost however remains high but it is expected that with the introduction of new rolling stock, and the replacement of coal burning engines by oil engines it would be possible to bring down that figure by an appreciable amount. The use of tractors and trailers is gradually spreading and is proving very efficient and economic, especially in cases where canes are transported over short distances.

J. Cost of production of Cane and Sugar

Attempts made to secure the services of a competent accountant have so far been unsuccessful. It has consequently not been possible to work out cost of production of cane and sugar.

K. Amendments and Additions to Ordinance No. 47 of 1941

1. Ordinance No. 49 of 1947 was enacted to give legal significance to thumb marks on receipts delivered by illiterate persons.

2. Government Notice No. 108 of 1947 was published with a view to preventing the closing down of weighbridges without the permission of the Central Board.

3. Ordinance No. 62 of 1946 was enacted to allow millers and planters to enter into contracts for a period of more than five years with the permission of the Central Board.

4. A Bill is under consideration by the Council of Government whereby millers will have to provide weighing scales for juice and for imbibition water so as to improve the chemical control of sugar factories.

R. Avice,
Registrar, Central Board.

Appendix 4

Agricultural Division

The Division worked at reduced strength throughout the greater part of the year although it had to face an even heavier programme of work. In April, Mr. A. d'Emmerez de Charmoy, Agricultural Officer, became immersed in the drive for food production, under the Food Production Board, while in June, Overseer G. Avice was transferred, on promotion, to the Sugarcane Research Station. The Tea Officer had not yet arrived nor had his assistant-designate assumed duties, so that work in connection with the Tea Industry continued to devolve upon us. In addition, considerable assistance was given to visiting advisers in connection with Tung Oil and the Fibre Industry and to the Mauritius Economic Commission. Mr. E. Lesur, Agricultural Officer, continued to help the Veterinary Division at the Palmar Cattle Breeding Centre.

2. Experimental work on Economic Crops

(a) Chillies. Chilly is a prolific crop and the various varieties yield well under local conditions. The different methods tried out to preserve long podded chillies in the dry state have given interesting results although definite conclusions have not yet been reached in regard to their practical application. So far the preserved chillies have kept well for many months, the product comparing favourably with the imported pepper. It is hoped that this investigation will be proceeded with when Mr. d'Emmerez de Charmoy returns to his substantive duties. *Maul's red-hot* pepper, introduced last year, was found to suffer sporadically from a soft rot of the pods. Nevertheless, it gave an encouraging performance and should find a place in local kitchen gardens.

(b) Soy Beans. A variety trial in which ten varieties were tested was laid down in April at Pamplemousses. The results obtained were as follows—

Java Forage	yielded	466	kilos per acre
Brunea	,,	454	,,
Avoyelle	,,	418	,,
Nigra	,,	418	,,
Charlie	,,	352	,,
Missoy	,,	346	,,
White	,,	334	,,
Bicolor	,,	322	,,
Nanda	,,	317	,,
Biloxi	,,	143	,,

The following new varieties were introduced from Java for preliminary trials: *Gendjah Slawi, Ringgit* No. 16, No. 27, No. 29 and No. 449.

No planter so far has shown any interest in this crop.

(c) Cowpeas. Mottled small-seeded is a variety best adapted for green manure. It gave 140 kilos of seed per acre. It is not likely to find favour with the planting community.

(d) Egg-Plant. The egg plant or brinjal is a popular vegetable often grown in large patches in the different localities especially in the northern districts. Several varieties are cultivated, some of which often suffer seriously from bacterial wilt. *Giffard*, a thin, dark purple, sickle-shaped, tasty, local variety shows considerable resistance and is prolific. In a comparative yield trial at Pamplemousses, it gave 3,550 kilos per acre while Rosita, a large, fleshy variety introduced some years ago, gave 3,107 kilos.

Two wilt-resistant varieties—Matale and Kopek—were introduced from Natal. They appear to be very promising but have not yet been cultivated widely enough for a correct appraisal of their performance under local conditions.

(e) Tomatoes. In 1946 a cross, *Marglobe* × *Local*, gave an abundant crop outyielding both parents. This year a trial was laid out in April under similar conditions to compare the performance of seeds of the hybrids with that of the local tomato. The difference in yield was only 10 kilos in favour of the cross which gave 1,050 kilos of fruit per acre.

(f) Potatoes. For the third year in succession, 'seed' which had been preserved from one season to the next by means of cold storage was tried out. The results were good; yields varied from 4.4 to 6.7 tons of tubers per acre, with very little difference between the seed from Madagascar and that from Mombasa.

(g) Other Crops. Small plots of a number of other crops were cultivated and observations recorded. These included plots of several varieties of yams, dhall Khessari, gram, various green manures, ginger, turmeric and pea-nuts.

3. The Fibre Industry

The Fibre Industry was the subject of much attention, especially towards the end of the year when two expert advisers visited the Island. Mr. G. W. Lock, O.B.E., Senior Agricultural Officer in charge of Sisal Development in Tanganyika, who was investigating the agricultural aspect of the question, was taken round and given all available information by the writer. The field experimentation work already done by the Agricultural Division, although on a modest scale, seemed to prove of considerable interest to him and the comparative trial laid down at Chaumière enabled useful comparisons to be made between the behaviour under similar conditions of *Sisal* and *Furcræa Gigantea;* it also made possible the rapid examination of the root systems of the two plants.

Late in the year the leaves of the Chaumière experiment were cut for the first time, the plants being two years of age, *Furcræa* outyielded *Sisal* in the number of leaves cut, in weight of leaves and in weight of fibre obtained. Each plot of this trial has been sub-divided into three parts and the leaves will, in future, be cut at intervals of six, twelve and eighteen months.

At the request of The Mauritius Economic Commission an investigation was carried out, in conjunction with the Chemical Division, into the fibre content of *Furcræa* grown in various localities and on different soil types, under conditions of shade or exposure to the sun. It appeared that leaves taken from Riche Terre area were richer in fibre than those from Black River.

4. Tung Oil

In July, Mr. C. C. Webster, Senior Agricultural Officer in charge of Tung Development in Nyasaland, visited Mauritius with a view to advise Government as to the possibilities of establishing a Tung Oil Industry in the Island. For two weeks the writer had the privilege of taking Mr. Webster all over the Country. After a thorough investigation, Mr. Webster in his report has confirmed the views expressed by local agricultural officers that it was unlikely that Tung could be grown economically under our difficult climatic conditions. Furthermore, the high cost of labour was a serious disadvantage as compared with African production.

5. The Tea Industry

Every tea factory has carried out some alterations with the view of improving manufacture. One factory is making plans for modifications which will go a long way to ensure control of the withering of the leaves.

In the field, Bois Chéri Estate has introduced improved methods of planting and supplying evolved in Ceylon with the result that loss of plant following upon transplantation has been eliminated.

Officers of this Division have maintained close contact with planters and ensured that provisions of the 1943 Tea Industry Control Ordinance were complied with. No permits were issued for new plantations, thereby conforming with stipulations of the Ordinance. The number of factories has not changed. The tea produced during the year amounted to 235,167 kilos.

6. Vegetable Seed Production

Again the season was generally favourable. Seeds were produced mainly at Réduit and Barkly and, to a small extent, at Pamplemousses. All seeds were cleaned, stored and sold at Barkly. The following quantities of seeds were obtained—

		Kilos
Beans :	*Victory*	176·50
	Golden Queen	72·10
	Long Tom	14·30
	Prolific Long-Podded	23·80
	Canadian Wonder	18·70
Broad Bean :	*Bocla*	1·00
Beet Root ...	... ...	·50
Bitter Gourd :	*Chinese*	·14
Brède de Chine :	*Bouquet*	5·80
	Blanc	7·10
Brinjal :	*Rosita*	1·73
Capsicum :	*Chinese Giant*	·62
	Neapolitan	·83
	Maul's red hot	·65
Carrot	... ...	·50
Cauliflower ...	... ...	6·50
Cowpeas ...	... ...	12·80
Lettuce :	*Blonde d'Eté*	1·81
	Sucrine	·34
	Mignonette	2·00
	Webb's Wonderful	1·17
Petsai :	*Distin's Type*	1·72
Tomato :	*Marglobe*	·56
	Pearl Harbour	·02
	Hawaii	·06
	Bounty	·04

Considerable progress has been made in this line of work notwithstanding the limited means and scanty accommodation at our disposal. Apart from raising the crops and producing the seeds, there is the question of seed preservation. For instance *Bruchus* spp. can do much damage to stored beans, but these are being successfully controlled by D.D.T.

A fine collection of our seeds was exhibited at the Inter-Islands Exhibition held at Tananarive, Madagascar, last October.

7. Plant Propagation

The routine production of a large number of economic and ornamental plants of all kinds for sale at moderate prices to the public continued as in the past at Barkly and Pamplemousses. The number of plants sold in our nurseries this year has exceeded the highest figure reached in the past. Lack of space precludes the making of a complete review of the work accomplished, but some of the principal items will be briefly mentioned—

(a) Avocado Pear. Side grafting has given very promising results at Pamplemousses and will be adopted extensively in the future.

(b) Bread Fruit. The demand for young bread fruit plants is steadily increasing but more of these useful plants should be grown all over the warmer parts of the Island. The bread fruit is propagated from root cuttings placed in the solar propagators. During the year, 458 plants were raised.

(c) Citrus Species. Since the incidence of a mottle leaf disease some years ago, many of the few citrus trees remaining in the Island have died. A great many seedlings were therefore produced. And, in an endeavour to resume work begun before the war by the Plant Pathologist to determine the cause of the disease, fifty citrus stocks were grafted with diseased and healthy scions of various species. 68 per cent. of these grafts germinated ; at the time of writing, four of them are showing signs of disease. Although it would seem that the disease is due to a virus, other experiments are being made, by this Division, with the following elements applied in very dilute solutions by spraying: iron, manganese, boron, copper, zinc and molybdenum.

(d) Mango. For the past two years considerable efforts have been made with a view to finding a suitable substitute for the method of in-arching which has hitherto given the steadiest results at our Stations. Budding and crown-grafting have not so far proved satisfactory enough. Side-grafting has given encouraging results at Pamplemousses but not at Barkly, probably owing to the prevalence of disease. It appears from observation that the scions should come from wood over a year old. We have now reached a point nearer our goal which is the complete elimination of in-arching in the propagation of mango by grafting.

(e) Peach. As a result of work pursued during the past two years a new technique of grafting peaches had been evolved by Mr. J. H. Julien, Agricultural Officer. It was thus possible to produce a total of 385 grafts and, for the first time, to meet the demand for this popular fruit. A special study was made of the germination of peach seeds under local conditions.

(f) Tea. Some experiments were carried out at Barkly on the rapid propagation of tea by the ' one-leaf-cutting ' method. When planted in the open, under fairly thick shade, such cuttings, treated with rootone, failed to produce roots. Cuttings were next treated with hortomone A and placed in a B.W.I. frame propagator. At the time of writing abundant formation of callous tissue has taken place.

8. Revenue

Although the policy has been to keep down prices because the Government Nurseries are not run primarily for making revenue but rather to propagate useful plants and to encourage the growing of fruit trees, revenue from the sale of plants has this year, beaten all records.

Nurseries	*1943*	*1944*	*1945*	*1946*	*1947*	*Previous Highest*
Barkly	1,649	1,248	850	1,827	2,780	2,132 (*1942*)
Abercrombie ...	1,738	1,738	942	2,149	3,076	2,149 (*1946*)
TOTAL ...	3,387	2,986	1,792	3,976	5,856	Nil

The above figures do not include the value of the plants supplied free to Government Institutions which, this year, amounted to Rs. 526.10.

The progress made in plant propagation and distribution is best shown by an examination of the number of the fruit trees sold annually. Records for the past three years are as follows—

	1945	*1946*	*1947*
Avocado	114	123	227
Bread Fruit	32	194	373
Citrus (seedlings) ...	223	362	1,930
Guava (seedlings) ...	27	330	373
Litchi (layers)	183	650	680
Mango (grafts) ...	111	367	368
Peach (grafts)	1	7	207
TOTAL ...	691	2,033	4,158

The sale of vegetable seeds brought in Rs. 1,080.63. The supply of seeds free to Government Institutions nearly doubled in value over last year and amounted to Rs. 1,100.74. These sums represented a total of 7,200 packets of seeds.

9. Barkly Experimental Station

The ' five-year plan ' of improvement designed to raise the standard of nursery and other field work and to secure adequate equipment and conditions of working is proceeding apace and useful progress has been accomplished. All the fields are now clear of ' chiendent ' *(Cynodon Dactylon)* ; anti-erosion measures have been completed over the whole Station.

During the year two solar propagators and one B.W.I. frame-propagator of a permanent design with detachable frames have been erected. The layout of irrigation pipes was altered and the distribution of water improved, especially to the orchards. A portion of a new drive through the orchard was

made and it is hoped to complete the network of new roads in this part of the Station in 1949. The construction of a new plant shed, of potting and propagating sheds, was begun and the new sheds have been designed to offer the highest resistance to the strongest cyclones.

Small orchards of guavas, peaches and avocado pears were laid out with selected varieties, while a new plot was planted with litchis.

10. Litchi

The litchi plant has been established in Mauritius for a long time and although it suffers appreciably from severe cyclones and is even at times completely destroyed it shows considerable powers of recovery. It has the immense advantage in a cyclone country of producing its fruit before the cyclone season really sets in. These qualities, coupled with the delicious flavour of the fruit, led to the exportation in ships' cool rooms of small trial consignments of litchi for sale in South Africa and London and the hope was entertained that a small but regular export trade would develop. The following quantities were shipped from 1936–37 to 1939–40—

Year	*Kilos*	*Price fetched on the London market per pound*
1936-37 ...	12,258	from 6d to 2/-
1937-38 ...	7,200	1/6 1/9
1938-39	19,200	1/- 1/6
1939-40 ...	536	—

The war put an end to this budding industry. Its possibilities have not, however, been overlooked and, in anticipation of future development, this Division initiated some experimental work in 1945. This work, carried out at Barkly and Pamplemousses, aimed at—

(a) determining with some degree of accuracy the best plants to propagate from, i.e., plants producing small-seeded fruits with plenty of meat and a relatively thin skin ;

(b) planting out small orchards with selected layers to provide parent material of the best types for future selectional propagation.

A preliminary selection was made in 1945 and, early in 1947, a small orchard containing 36 plants, the progeny of high performance parents, was laid out at Barkly.

11. Royal Botanical Gardens, Pamplemousses

These gardens continued to receive devoted attention from the members of this Division concerned with its upkeep and rehabilitation. One thousand and eighty plants comprising a large number of species have been raised and planted out since the inception two years ago, after the destructive cyclones of 1945, of a programme of rehabilitation. In view of the competition for light and plant food from established trees and the grass ground cover the young plants require much care to help them up through the difficult early stages until the time when they may be expected to fend for themselves.

In the nursery a large number of plants were raised and sent to Abercrombie Nursery for sale. 461 mango grafts and 600 litchi layers were prepared.

12. School Gardens

The thirty-two registered school gardens were inspected at regular intervals. Prizes were awarded in July to the best gardens, the first six prize-winners being—

	Rs.
Poudre d'Or Government School	40
Ruisseau Rose ,, ...	20
Camp Diable ,, ...	20
Rivière des Anguilles Government School	20
Plaisance, Church of England Aided School	20
Vieux Grand Port, Roman Catholic Aided School	15

The general standard was on the average somewhat better than last year but there is still considerable room for improvement. It is hoped that this will be achieved through the appointment of a whole-time officer in the person of Mr. G. Bauristhene, Agricultural Instructor, whose assistance in the past has been so valuable to me.

13. Visits to Small Planters

The usual centres of production of vegetables and food crops have been visited on numerous occasions by the three Agricultural Officers. In connection with this aspect of the Division's activities it is as well to bear in mind that this is not the only extension work carried out. Thus, small planters receive in addition the attention of recently appointed instructor-officers of the Sugarcane Research Station, while Tobacco Inspectors and the Food Production Board's Inspectors also cater for this class of cultivators. The existence of these collateral services enable the Agricultural Instructors to concentrate their energies mostly on growers of vegetables and food crops.

14. Allotments

In the course of the year two allottees were evicted for serious neglect of plots of land, six died and fourteen left of their own accord. All these vacancies were at once filled up from the waiting list of applicants.

The various allotments were regularly visited and advice given on the best methods of cultivation and the means of controlling pests and diseases. At Curepipe, the wettest locality where a tendency to severe erosion during the heavy rains is well marked, a plot was especially laid out with contour bands at suitable intervals and the use of the striding level and of stop-wash plants in the control of erosion was explained to the allottees. Some of the more active and progressive among them have already adopted conservation devices as a result of this demonstration.

The granting of a bonus by Government for the planting of food crops has acted as a stimulus to greater effort at production among the allottees although a considerable number among them still appear determined to follow the line of least effort.

15. Plant Introduction

Plant introduction and acclimatization is another of the multifarious duties of this composite Division. Among the various plants and seeds introduced during the year, the following may be specially mentioned—

Two wilt resistant varieties of brinjal, *Matale* and *Kopek* from Natal.

Six varieties of soy bean, from Java.

Nymphæa grandiflora (yellow), from Amani and Durban.

Eucalyptus Trabutii, a rapid growing hybrid, from Algeria.

Amherstia nobilis' Queen of the Flowering Trees, from Burma.

Colpothrinax Wrighti, the Bottle Palm of Western Cuba, from Cuba.

Vitex peduncularis var *Roxburghiana*, useful in the treatment of black-water fever, from Assam.

Erythrina micropteryx, a beautiful shade and ornamental tree, from Trinidad.

16. Higher Agricultural Education

The courses in agricultural subjects and practical demonstrations were given to students of the College of Agriculture as in previous years with the modification that, owing to Mr. d'Emmerez de Charmoy's secondment to the Food Production Board, the lectures in Principles of Tropical Agriculture and in Agricultural Geology were delivered by the Senior Agricultural Officer.

17. Miscellaneous

(a) Economic Commission. The Division has contributed its small quota to the labours of the Mauritius Economic Commission by preparing memoranda on crops, past and present, with causes of their failure, on fibre and tea, and by sending members to various sub-committees dealing with secondary industries, food crops and vegetables.

(b) Lælang Grass. The work of eradication proceeded as new foci were discovered. It is expected that in one more year the last of this undesirable weed will have been eliminated.

(c) Food Settlements. The 'food settlements' at Saint Martin, Saint Thomas and La Ferme were inspected from time to time for advisory purposes.

(d) Radio Talks. As part of the propaganda in the drive for more intensive production of food crops, Mr. A. d'Emmerez de Charmoy and the writer gave a series of broadcast talks in French on agricultural topics and on the culture of vegetables respectively, from April to October.

(e) Publications. 1. At the request of a number of listeners, the talks given by the Senior Agricultural Officer on the culture of vegetables were published under the title "Le Jardin Potager." In the absence of a modern work on the growing of vegetables in Mauritius, its publication should serve a useful purpose. It is being issued to all primary schools.

2. A bulletin on the "Production of Vegetable Seeds in Mauritius" was prepared for publication by the Senior Agricultural Officer and Mr. J. H. Julien, Agricultural Officer. It embodies all the findings

obtained in the course of the research work accomplished on the growing of vegetables for the production of seeds under local climatic conditions. It should prove of value not only because there is a paucity of such publications in Tropical Agriculture but also in showing the way to anyone who may embark upon the production of seeds for business and in supplying valuable information to a relatively large group of small planters who are either professional market-gardeners or amateur vegetable producers.

(f) Acknowledgment. In conclusion, I should like to put on record my appreciation of the willing co-operation of many members of the public and, last but not least, of the loyal support I have received during the year from all the officers of this Division.

G. A. North Coombes,
Senior Agricultural Officer.

Appendix 5

Sugar Technological Division

1. Visits to Sugar Factories, Investigations, Etc.

During the year under review the 31 factories were visited by the Sugar Technologist and his assistant as well as the eleven distilleries producing purified alcohol and rum.

In one factory, at the request of the Manager, all the processes of sugar manufacture were investigated and recommendations made for the improvement of methods and plant.

The indicated horse power of mills engines was determined in two factories with the following average results—

TABLE I

Power consumption of Mills

I. H.P. per ton of fibre per hour

		Factory No. 1		*Factory No. 2*
Crusher, 1st Mill	...	42·0	}	34·2
2nd Mill	...	24·1		
3rd Mill	...	24·4	}	44·0
4th Mill	...	—		
Tons of fibre per hour	...	4.54		7·92

Six milling tests were performed at various factories with a view to adjusting settings for maximum efficiency.

Advice was given when sought for and routine analytical work carried out for the factories and distilleries.

2. Factory Tests of New Cane Varieties Against M.134/32

During the crop three varieties of canes M.76/39, M.165/38 and M.63/39 recently released by the Sugarcane Research Station were tested in factories. Results obtained are shown in the following tables.

TABLE II

FACTORY TESTS OF NEW CANES VARIETIES AGAINST M.134/32 PERFORMED DURING THE 1947 CROP

Variety M 165/38

Date	*Place of growth and factory*	*Category*	*Age Months*	*Yields on canes T/A*	*Purity 1st Expd. Juice*	*Fibre %*	*Richesse*	*C.C.S. ext. % canes*	*C.C.S. ext. per arpent*
31. 7 ...	Savinia (Savinia)	Virgins	11½	54·1	81·7	12·5	10·91	8·27	7·50
5. 8 ...	Rich Fund (Sans Souci)	2nd Ratoons ...	14	30·4	85·4	10·6	12·96	10·94	3·33
7. 8 ...	Mon Répos (Médine)	Virgins	16	78·5	87·7	14·2	12·35	10·37	8·14
7. 8 ...	Tamarin (,,)	,, ...	12	38·4	84·0	13·9	12·23	10·18	3·91
11. 9 ...	,, (,,)	1st Ratoons ...	?	34·1	87·4	14·0	12·72	10·54	3·59
2.10 ...	3 Ilots (Beau Champ)	Virgins	14½	49·4	87·9	12·9	13·32	11.38	5·62
30.10 ...	La Mivoie (Médine)	?	?	47·0	85·2	13·3	12·70	10·43	4·91
7.11 ...	Beau Plan (Beau Plan)	?	?	?	86·5	12·8	14·10	11.71	?
21.11 ...	Grande Rosalie (The Mount) ...	Virgins	17½	27·0	89·5	—	16·28	14·18	3·83
	MEAN			49·9	86·1	13·0	13·06	10·89	5·10
	Mean figures obtained, with M 134/32 (witness) ...			36·0	90·5	12·2	14·58	12·71	4·57

TABLE III

FACTORY TESTS OF NEW CANE VARIETIES AGAINST M.134/32 PERFORMED DURING THE 1947 CROP

Variety No. 63/39

Date	*Place of growth and factory*	*Category*	*Age Months*	*Yield in canes T/A*	*Purity 1st Expd Juice*	*Fibre %*	*Richesse*	*C.C.S. rel. % canes*	*C.C.S rel. per arpent*
5. 8 ...	Rich Fund (Sans Souci)	2nd Ratoons ...	14	38·6	84·2	11·6	11·82	9·82	3·79
7. 8 ...	Mon Répos (Médine)	Virgins	16	65·2	82·0	13·0	10·74	8·47	5·52
11. 9 ...	Tamarin (Médine)	1st Ratoons ...	—	66·7	88·9	13·4	13·60	11·48	7·66
2.10 ...	3 Ilots (Beau Champ)	Virgins	14½	45·7	86·9	12·8	12·51	10·58	4·83
30.10 ...	La Mivoie (Médine)	—	—	46·0	86·3	11·3	12·20	10·25	4·72
21.11 ...	Grande Rosalie (The Mount) ...	Virgins	17½	30·9	90·9	—	16·22	14·31	4·42
	MEAN			48·9	86·5	12·4	12·85	10·82	5·16
	Mean figures obtained with M 134/32 (witness) ...			36·9	90·7	11·5	14·82	13·05	4·79

TABLE IV

FACTORY TESTS OF NEW CANES VARIETIES AGAINST M.134/32 PERFORMED DURING THE 1947 CROP

Variety M76/32

Date	*Place of growth and factory*	*Category*	*Age Months*	*Yield in canes T/A*	*Purity 1st Expd Juice*	*Fibre percent*	*R.V.*	*C.C.S. ext. % canes*	*C.C.S. ext. per arpent*
31. 7 ...	Savinia (Savinia)	Virgins ...	11½	47·6	78·8	11·3	10·59	8·33	3·97
5. 8 ...	R. Fund (S. Souci)	2nd Rns. ...	14	39·0	87·0	13·4	12·92	10·96	4·27
7. 8 ...	M Repos (Medine)	Virgins ...	16	59·4	82·3	11·0	11·84	9·47	5·62
7. 8 ...	Tamarin (Medine)	Virgins ...	12	41·4	85·9	11·5	12·89	11·03	4·56
11. 9 ...	do. do.	1st Rns. ...	?	49·1	89·4	12·5	14·21	12·12	5·95
2.10 ...	3 Ilots (Beau Champ)	Virgins ...	14½	45·5	88·4	11·9	14·43	12·46	5·67
30.10 ...	La Mivoie (Medine)	do ...	?	40·0	90·4	11·7	15·38	13·46	5·38
21.11 ...	G. Rosalie (The Mount)	Virgins ...	17½	34·4	90·0	—	16·02	14·02	4·82
5.12 ...	Rivière des Anguilles (Terracine)	do ...	14	—	90·1	—	15·33	13·44	?
Mean			—	44·4	86·9	11·9	13·73	11·70	5·03
Mean figures obtained with M134/ (witness)			—	36·0	90·6	12·0	14·67	12·86	4·57

From the foregoing results it can be concluded that these varieties offer economic possibilities, although the variations in figures for individual tests suggests that a certain amount of caution should be observed with respect of their propagation.

3. Production of Distillers' Yeast

During the year 5,700,000 tablets of autolysed yeast were issued to hospitals, schools and to the public. These tablets have the following average composition—

TABLE V

AVERAGE COMPOSITION OF AUTOLYSED DISTILLER'S YEAST TABLET

Protein	20%
Ash (including calcium salts)	23%
Calcium salts expressed as Calcium Carbonate ...	4.8%

Production of a yeast-bran mixture containing about 15 per cent. Distillers' Yeast has begun. Plant is available for the production of 80 to 100 tons per annum of the mixture.

4. Inventory of plant in Sugar Factories and Distilleries

At the request of the Mauritius Chamber of Agriculture, the Sugar Technologist prepared a complete inventory of plant in each sugar factory, a report on each department of each sugar factory and a detailed estimate of expenditure that would be necessary in order that each factory should operate under the most efficient conditions.

An inventory and valuation of the 11 distilleries is being prepared.

The above work is for submission to the Mauritius Economic Commission.

5. Controle Mutuel and Factory Results

28 factories contributed to the fortnightly returns of factory results which were compiled and distributed. Comparative results of the most important figures are given in the following tables.

TABLE VI

Average Crop Results 1943–1947

Year	Sucrose % Cane	Fibre % cane	Mill Extraction	Sucrose in sugar % cane	Reducing Sugars House Recovery	Boiling House Efficiency	No. of crushing hours per day	Remarks
1943 ...	14·07	12·92	95·1	11·92	86·0	98·4	14·0	—
1944 ...	13·40	13·05	94·9	11·20	87·8	95·2	12·2	cyclone yr.
1945 ...	13·42	13·86	94·6	10·97	87·3	98·1	13·1	—
1946 ...	13·56	12·58	94·9	11·35	88·0	98·7	15·0	—
1947 ...	14·37	12·5	94·9	12·26	87·8	98·7	18·2	—

6. Educational

The usual lectures and practical demonstrations were delivered by the Sugar Technologist and the Assistant Sugar Technologist to the students of the College of Agriculture. The students were also taken on visits to factories.

7. General

The Sugar Technologist sat on the following Committees—

La Société des Chimistes.

Factory Efficiency (Mauritius Economic Commission).

Mauritius Industries other than Sugar (Mauritius Economic Commission).

The Alcohol Sub-Committee (Development and Welfare).

S. STAUB,
Sugar Technologist.

Appendix 6

Division of Plant Pathology

1. Staff Changes

The Plant Pathologist spent a considerable part of his time from May to October—collecting essential information for the Mauritius Economic Commission appointed by the Secretary of State for the Colonies to study the conditions occurring in the sugar industry of the Island. From October onwards, he was appointed Joint Secretary to the Commission, when the Assistant Plant Pathologist became acting Head of the Division.

Towards the end of December, a Plant Inspector was appointed for whole-time work at the Customs in Port Louis ; he will also be responsible for the inspection at air bases in the island.

2. Diseases of Sugarcane

A. RED ROT (caused by *Physalospora tucumanensis Speg.* *Colletotrichum falcatum* Went.).

(a) Incidence of the disease. Although occasional cases of the disease were encountered in the M.134/32 fields during visits on estates, the crop was remarkably free from red rot this year, this being attributable to the climatic conditions highly favourable to cane growth experienced throughout the year. The fears entertained some years ago about the future of that variety, when the cane crop, after having badly suffered from the effect of cyclones, had shown an alarming incidence of the disease, have given place to more confidence. The behaviour of the cane in 1946, and chiefly in 1947, has indeed shown that under normal conditions when its vitality is not unduly lowered and the biological balance controlling the incidence of borers is not upset, M.134/32 can be relied upon to give very high returns.

(b) Research Work. The researches started last year about the effect of age on the susceptibility of cane stalks to *Colletotrichum falcatum* were continued this year. The experiment was carried out with canes of different ages, 25 stalks being inoculated in each case as described in last year's report.

Observations on the spread of the disease within the inoculated canes were made about two months later. The experiment will be repeated until sufficient data have accumulated for the drawing of conclusions.

B. Research Work on *Xanthomonas vasculorum* (Cobb) Dowson

(a) Natural mode of infection of palms. The researches started in previous years and continued with more vigour in 1946 and 1947, with the view of determining the natural mode of infection of the white palm *Dictyosperma album* Wendl. and Drude by the sugarcane gumming disease pathogen, have not yielded the expected results. Further work is still necessary in this direction.

(b) Discovery of the organism on the areca nut palm. A few tall areca nut palms (*Areca Catechu* L.) having this year been found long dead in close proximity to the spot in Rose Hill where an outbreak of bud rot by *X. vasculorum* occurred on the royal palm in 1944, a search was made on other rather young areca palms near by. As a result, a few chlorotic leaflets with a peculiar dappled aspect were discovered on the oldest leaf of the crown of an otherwise perfectly healthy looking plant. The leaflets would not have been collected had it not been for the fact that they were showing long, faint, yellowish-brown veins from the dead areas towards their tips downwards when examined by transmitted light. When brought to the laboratory, they exuded gum from whole leaf sections under the microscope. With palms, this test is up to the present specific for *X. vasculorum*, and cultures of the affected leaflets yielded the organism as expected. The identity of the isolate was proved by inoculations into sugarcane leaves and maize.

The results of this study will be published in 1948.

3. Banana Diseases

(a) A new Wilt Disease. A severe wilt disease of the " Gingeli " (Lady's fingers, *Musa* sp.—and " Carrée "—*Musa paradisiaca L.*—bananas occurred at Moka. The underground parts of the plants were affected by a fungus forming plates of white mycelium between the leaf sheaths and within the tissues of the corm. The affection suggests a disease similar to the *Marasmius* root disease of the plant decribed from the West Indies. Fructifications of the fungus have not been observed. The fungus, a very slow-growing one on ordinary media, even on rice, has been obtained in culture, and inoculation experiments are to be carried out.

(b) An obscure disease. Another disease which apparently is of long standing in the island, attracted attention during the year. It affects the dwarf banana *(Musa Cavendishii* Lamb.) and is characterised—

(i) by a reduction in length of the petioles with the result that the leaves remain crowded together ;

(ii) by a failure of the bunches of fruit to develop normally, and

(iii) by a rotting of the pseudo-stem of the plant. Some of the symptoms suggest a virus infection, but the fact that the disease is worse upon the plant during the setting of fruit may indicate that it could be due to some nutritional disturbance.

4. Blight of Manioc Leaves

The bacterial blight reported in previous years on the plant (Annual Report 1940) was again investigated this year. The causative organism was reisolated and as information had been received that the earlier isolate had shown certain resemblances to *Xanthomonas solanacearum* (E.F. Smith) Dowson, the latter organism was isolated from diseased potato and tabac marron (*Solanum auriculatum* Ait.) plants for comparative inoculations into manioc leaves. The identity of the *X. solanacearum* isolates was proved by the production of bacterial wilt following inoculation into tomato plants. Accidentally, this proves that the wilt of *Solanum auriculatum*, which apparently had never been studied before, is caused by *X. solanacearum*.

The inoculations of manioc leaves with the manioc isolate were positive without one exception ; the parallel inoculations with the *X. solanacearum* isolates, were however all negative.

A cultural study also showed the organisms to be different. A culture sent to Dr. M. P. Starr in America (vide 12 below) was considered identical to the manioc pathogen occurring in South America and described as ***Xanthomonas manihotis*** (Art.-Berth. and Bondar) Dowson.

5. Blight of Paspalum dilatatum

Some considerable time was spent this year studying a disease of the grass *Paspalum dilatatum* Poir. The disease appears as a blight of the leaves, commencing at the tip and running downwards along one edge, the tissues turning yellow before finally dying out. Sometimes the affected leaves show a narrow, yellow stripe of regular width, with diffuse borders, running down the leaf ; occasionally a white line, as in leaf scald disease of sugarcane is evidenced on the leaf.

The disease had already attracted attention for many years past, and casual trials at isolation of the pathogen had been effected, but the latter proved very difficult of isolation on the ordinary laboratory media used. Success was however attained by the obtention of a certain number of colonies, and the pathogenicity of the organism was proved by inoculation into its host. It was also successfully inoculated into a certain number of other plants, but reisolation from these was difficult ; it even failed with several of the hosts.

The characters studied in the laboratory, in parallel tests with *Xanthomonas albilineans* (Ashby) Dowson isolated from leaf scald-affected sugarcane leaves, were found to be practically similar for both organisms. The symptoms induced on maize and on *Thysanolæna maxima* (Roxb.). O. Kuntze are very much the same for the two organisms. Although white lines also result from inoculation into spindles of sugarcane, Job's tears and elephant grass, as is the case with *X. albilineans* (vide La Revue Agricole Maurice XXI, 6, 285–304, 1942) there are somewhat more important differences between the two bacteria on these plants than on maize and *T. maxima*. The infection picked up by cane does not also become systemic, as happens with the leaf scald organism.

Certain constant differences in the symptoms exhibited by the inoculated plants are sufficient to class the two organisms as definitely not identical.

6. Disease of Citrus

In the Annual Report for 1942 (p. 10) it was stated that experiments in view of determining the presence of fungi connected with the disease in the roots of affected plants had given negative results. Previously, treatment with various major and minor elements had yielded no significant results (Annual Report 1939 p. 13).

This year two series of graft experiments were carried out in order to probe into the possibility of the disease being of virus nature.

In one set, scion from healthy, and in the other from diseased plants, were grafted on to healthy potted stock. The grafts were only just beginning to grow at the end of the year. The help received from the Agricultural Division in the grafting operations is here gratefully acknowledged.

7. Inflorescence blight of "Herbe Condé"

Through the increasing number of investigations on plant diseases and the lack of adequate staff, the acting Plant Inspector was made to partake directly in the research work of the Division by being assigned the task of investigating under supervision an inflorescence and fruit blight of "herbe condé," *Cordia macrostachya* Jacq. a shrub constituting a pest of cultivated and pasture fields in the island. As a result, a species of *Gloeosporium* was isolated which, inoculated by pricking young inflorescences with a fine needle and then spraying them with a spore suspension of the fungus, resulted in infection being picked up, from which the fungus was again obtained in culture.

Two other sets of infection experiments, however, gave negative results viz—

(i) the spraying of unpricked inflorescences ; and

(ii) the dipping of inflorescences in a spore suspension, coupled with the preventing of too rapid drying out by protection for 24 hours within glass tubes plugged with cotton wool.

These experiments, which perhaps indicate that infection is secondary to injury to the young inflorescences by feeding insects, thrips or other, need repeating.

Studies on the seasonal variations of the disease and comparative germination tests with seeds from healthy and from blighted fruits were also started.

8. Anthracnose of litchi fruit

A brown to black spotting of ripening litchi fruit is commonly believed in the island to result from over-maturity of the fruit. The possibility of its being consequent upon fungus infection was investigated this year, and as a result, a *Glœosporium* was isolated from numerous cultures of the pericarp of the diseased fruit. Inoculation experiments were not carried out as the isolations were effected at the end of the ripening season ; the investigations will be resumed in future crop seasons.

9. Wilt of the royal palm

A wilt disease of the royal palm (*Roystonea regia* O. F. Cook) at Case Noyale in the wooded district of Black River, rather far distant from sugar-cane plantations, occurred towards the end of the year; it was unfortunately not reported until the plants were in an advanced stage of decomposition. The disease was nevertheless found to be different from the bud rot caused by *Xanthomonas vasculorum* (Cobb) Dowson, and investigations are in progress to determine its nature. There are thus at least two different diseases responsible for the death of royal palms in the island.

10. Minor diseases

On Aster

From a blight of aster leaves, a species of *Xanthomonas* was isolated which, however, failed to produce infection.

On pawpaw

A disease of the pawpaw plant characterised by the production of much reduced and distorted leaves was investigated. The symptoms suggested a virus infection, but inoculation into tobacco plants by the gentle handling of their leaves with the fingers wetted with crushed juice from the diseased pawpaw leaves gave no result. The plants recovered after a time, during which considerable stunting had resulted.

On cabbage

A species of *Xanthomonas* was isolated from the suspected black rot disease which occurs in the island on cabbage and cauliflower. Inoculations into these two plants were positive. The organism was considered in America to be *Xanthomonas campestris* (Pam.) Dowson, as was suspected.

On linseed

A collar rot caused by *Sclerotium* sp. (Rolfsii?) occurred on young plants at the Central Experimental Station, Réduit.

On Nigella

A species of *Phytophthora* was found to be responsible for a collar rot of *Nigella damascena* L. which occurred in Rose Hill.

11. Small-tube cultures

Late in 1946 and early in 1947, experiments were carried out with the object of developing a technique by which cultures of bacteria for study could be forwarded by air at as low a cost as possible. The following procedure was found convenient: with a small pipette, about 1·2 c.c. of melted 2 per cent. agar medium is poured into $2 \times \frac{3}{8}''$ Durham fermentation tubes, which are plugged, sterilised and stab-inoculated. Sealing the tubes with paraffin wax is not recommended. As a result of the puncture made during the inoculation and of subsequent evaporation, a split occurs in the medium after one or two days; this, however, constitutes an advantage in affording increased surface for growth. Such cultures, each of which weighs only about three grams, can be relied upon to remain alive for two months.

A parcel of 14 cultures, with the tubes lightly wrapped with tissue paper and packed with cotton wool in a light cardboard box, weighed only 90 grams and the cost by air mail to England was 9 shillings. It was received at Kew in good condition externally, but one of the tubes was found broken inside. A short article on the subject was forwarded to the Director of the Commonwealth Mycological Institute for publication.

Later information was received that a parcel forwarded to America had been badly crushed during transport ; in consequence a box of pinewood $\frac{1}{8}$ to $\frac{1}{32}$″ thick is recommended. Such a box, $2\frac{1}{2}$″ × $1\frac{1}{2}$″ × $1\frac{3}{4}$″ weighed only 17 grams and could accommodate 9 tubes. A parcel of 7 cultures in the box weighed 60 grams and the transport to London cost only 6s. 8d. These notes are given here with the belief that they may prove useful to mycologists at large.

12. Bacterial cultures sent to America

In 1945, a request had been received from Dr. M. P. Starr, now Assistant Professor in the Division of Bacteriology of the College of Agriculture, University of California, for a supply of bacterial plant pathogens. Our collection of type cultures having been lost through shortage of staff during the war, it was only late in 1946 and during 1947 that cultures could be forwarded to Dr. Starr. Altogether 31 bacterial cultures were forwarded, at first by surface mail and later by air transport in Durham tubes.

13. Control of Imported Plant Material

As usual, the Head of Division supervised the inspection of imported plant material at the Customs in Port Louis, and at Plaisance airfield.

As a result of the criticisms levelled in 1945 against the mode of disinfection of incoming planes, the procedure is now much more efficiently carried out, under the immediate personal control of a Government Medical Officer.

During the year advantage was taken of the presence of a Plant Inspector at the airbase at each arrival to have the plane visited by the Inspector prior to the landing of the passengers, with the object of collecting any live insect which might be found present. The insects, collected in killing tubes, are afterwards forwarded to the Entomological Division for identification. It is hoped that the information which will be gradually collected thereby, may prove useful in the future.

In December, the following cane varieties were received from the United States Department of Agriculture, viz., C.P. 34–120, C.P. 36–13 and C.P. 36–105 ; they were planted in the Quarantine Greenhouse at Réduit.

14. Miscellaneous

The work reviewed in this report was the share of the officers of the Division as follows: the investigations on red rot and pineapple diseases and on Citrus chlorosis were carried out by the Plant Pathologist ; those on *Cordia* blight by the Acting Plant Inspector ; the remainder was dea't with by the Assistant Plant Pathologist (now Acting Plant Pathologist).

In addition to the work surveyed here, close contact was kept with the planting community by frequent visits paid to estates and to small planters ; when current diseases were investigated on the spot and advice given when necessary.

Lectures in Botany and Plant Pathology were delivered as usual by the Plant Pathologist and his Assistant to the first, second and third year students of the College of Agriculture. From May onwards, when the Plant Pathologist was busy with work for the Mauritius Economic Commission as already explained, lectures were also delivered by the Acting Plant Inspector.

A complete account of the studies effected on the bud rot of royal palm in the island caused by *X. vasculorum* was published in La Revue Agricole, Vol. XXVI, No. 5.

Opportunity is here taken for gratefully acknowledging the valuable assistance received from the Commonwealth Mycological Institute and Dr. W. J. Dowson of the Botany School, Cambridge, and from Dr. M. P. Starr, of the University of California.

G. Orian,
Acting Plant Pathologist.

Appendix 7

Entomological Division

1. Staff

The post of Entomologist remained vacant during the year. Messrs. A. Moutia and R. Mamet continued to act as Entomologist and Assistant Entomologist respectively. Mr. P. Hermelin was appointed as Phytalus Officer (*vide* Mr. A Delord's retirement).

Mr. P. Regnard was sent on Entomological mission in Madagascar (Nossi Bé) during the period 14th January to 9th May. Early in December Mr. L. Orieux was appointed Plant Inspector. The various posts, pertaining to Economic Entomology in the Island and created in the Development and Welfare Ten year plan have not yet been filled.

2. Pests of Sugarcane

(a) Clemora smithi (Arrow).

The white grub, *Clemora smithi*, continued to be a severe pest of sugarcane in the island. Heavy infestations were recorded in the Savanne and Grand Port districts ; the losses sustained by some estates were very severe. Scoliid parasites owing to the dry season which prevailed, were very scarce. Every effort was made to cope with the situation in the infested regions. Liberation of scoliid parasites were made whenever possible and a campaign for the propagation of food plants was systematically carried out. Experiments with the various insecticides: Gammexane and D.D.T. ; carbon disulphide and P.D.C.B. were carried out on Clemora larvæ. The results of these trials are given in another section

of this report. The importation of parasites from other countries with a view to furthering the control of this pest, remained at a standstill owing to the shortage of staff. It is contemplated to import from England through the Imperial Biological Bureau, the dexiid fly: *Dexia rustica*. This is but a side line work to the projects, not yet materialised, of introducing more parasites from Java, North Africa and British Guinea under the Development and Welfare scheme.

(b) The spotted borer : Diatræa saccharíphagus Bojer.

This moth borer of sugarcane was recorded in various localities in the Island ; the northern part was more severely attacked this year. In one locality infestation was of a very high index: stalk infestation 100 per cent. ; joint infestation 30 per cent. ; intensity index 55. The yield per arpent dropped from 25 tons to 7 tons. This state of affairs was naturally enhanced by the dry season which prevailed in that locality. To further the control of this pest a second entomological mission was sent to Madagascar for the mass collection and shipment of the insect: *Euvipio rufa* Szep.; a parasite previously recorded on a species of *Diatræa* in that country. From January to May, a total of 684 *Eucapsa* adults were collected. Of these only 237 were received alive in Mauritius. The high percentage of mortality was accountable to the transit voyage which sometimes was over twelve days, and to the initial number of adults damaged during the collection and manipulation in the field by unskilled labourers. Three colonies of about fifty to sixty parasites each were made in infested centres, contiguous to one another, in the Northern part of the Island. Owing to the unsettled conditions which prevailed in Madagascar at that time, the mission had to end earlier than projected.

The life history of *Euvipo rufa* Szep. on *D. saccharíphagus* Bojer, was found to be as follows in Madagascar and Mauritius—

	Mauritius	*Madagascar*
Egg stage	2– 3 days	1½– 2 days
Larval stage ...	8–10 ,,	4½– 5½ ,,
Pupal stage... ...	16–23 ,,	18 - 20 ,,
TOTAL ...	26–36 ,,	24 –27½ ,,

Owing to the ready attack and development of this parasite on *D. saccharíphagus* in the field, further introduction in Mauritius in very large numbers should not be overlooked in the forthcoming years.

As a continuation of the policy of parasite importation into the Island, advantage was taken of the co-operation of Dr. F. J. Simmonds in Trinidad to obtain some of the well-known West Indian tachinid parasites of moth borers in these regions. In the first instance shipments of the two parasites: *Lixophaga diatræea* Tns., and *Paratheresia claripalpis* Wulp., were received by the Air Mail Route: Trinidad—London—Paris—Mauritius. Eleven shipments of *Lixophaga* and eighteen shipments of *Paratheresia* were received during the period June to October , 1947.

The following table recapitulates the shipments:

	Paratheresia	*Lixophaga*
1. Number of shipments sent	18	11
2. Maximum No. of days of transit ...	30	30
3. Minimum No. of days of transit ...	8	8
4. Average No. of days of transit ...	14	15
5. Total No. of puparia sent	1,198	1,248*
6. Total No. of live flies obtained ...	819	240
7. Percent live flies received	65·5†	25·3†

The Lixophaga shipments were the less successful. Out of the eleven shipments, two shipments of 150 puparia each were never received and on three other shipments out of 528 puparia sent, all flies emerged during the transit and were received dead. This heavy loss as compared to the Paratheresia may be due to the rather shorter period of pupal stage of Lixophaga as compared to that of Paratheresia.

Owing to the very small number of Lixophaga obtained, only one colony of 141 adult flies was made at Mapou Leclézio. The Paratheresia were liberated in 5 centres in colonies from 30 to 200 flies.

Inoculations of young larvae of these two flies were made in the Laboratory on *Diatræa saccharíphagus* larvae of all sizes. Positive inoculations were obtained only with Lixophaga. On a total of 281 borer larvae inoculated 30 per cent. were successfully parasitised. The young Lixophaga larvae penetrated readily in the moth caterpillar and adult flies therefrom were successfully obtained. The period from the time the Lixophaga larvae were placed on the host borer until adult flies emerged varied from 25 to 30 days ; the pupal stage varied from 16 to 18 days ; pre-pupal from 1 to 2 days ; larvae connected by funnel in the host from 6 to 8 days; larvae from the first instar free in the body cavity from 1 to 2 days. Mating of both species of flies were obtained in breeding cages as used by Scaramuzza, i.e., of size 24″ × 24″ × 24″. Twelve to fourteen days after their emergence dissections were started, young Lixophaga larvae were generally obtained. It was found necessary to extend this period to 20 to 25 days during the winter season when fully developed eggs and young larvae could be obtained. The number of larvae inoculated per host were 3 to 5, but in most cases only one fly puparium was obtained and very rarely two. With Paratheresia fully developed eggs and young larvae were obtained generally 15 to 16 days after the hatching of the fly. In one case young larvae were obtained from adult flies old of 35 days. The feeding of the flies in all cases consisted of dried raisins ; sugar and honey solution, granulated sugar and split sugarcane stem. Moistened cotton pad was placed at the top of the cages and spraying of the cage with water was systematically carried out during the breeding.

3. The Eucalyptus snout beetle : *Gonipterus scutellatus* Gyll.

Collections of eggs from May–June were carried out with the co-operation of the Forest Department. Out of 54 samples received 100 per cent. were found parasitised by the Mymarid: *Anaphoidea nitens* Gir. Parasitism as high as 76 per cent. was recorded. The mean parasitism during the year for

* including 2 shipments of 300 puparia which were never received and 215 inoculated borer larvae.

† Figures calculated on actual shipment received.

several regions in the Island amounted to 27·7 per cent. Parasitised egg capsules were collected sometimes 9-10 miles off the original centre of liberation. The rapid establishment of this parasite in the Island was a most encouraging state of affairs. Its beneficial effect was soon felt by the reduction of infestation in places priorily heavily attacked by *Gonipterus*.

4. Control of Black Sage : *Cordia macrostachya* Jacq.

From February to April, eight consignments of the *Cordia* leaf-eating insect : *Physonota alutacea* Boh., were received from Dr. F. J. Simmonds in Trinidad. The total number of live individuals obtained was 218 out of 450 sent. The percentage of mortality during transit amounted to 51·7 per cent. The number of days of transit from Trinidad to Mauritius varied from 19-22 days. The minimum percentage of live insects received was 10 per cent. and the maximum 100 per cent., the average number of adults sent per consignment was 50 ; only one shipment was of 100 individuals. The adults on reception were bred in a quarantine green house used as an insectarium. Laying soon started and a new generation of insects has been obtained. Feeding tests were subsequently carried on 88 plants of economic importance in the Island using the adult beetles and larvae of the various stages. No economic plants were found attacked except two other Cordia species viz. *Cordia abyssinica* and *Cordia myxa* and another Boraginaceae : *Ehretia acuminata*.

In presence of the same results obtained in several replications of the tests, it was decided to liberate this Chrysomelid in the Island and this was done after previous recommendations from Dr. Simmonds who carried out similar feeding tests in Trinidad with same results. From June to December over 3,000 adults Physonota obtained from local breedings were liberated in twenty different localities of the Island. With the above number of adults mentioned over 4,000 larvæ and 300 batches of eggs (i.e., about 7,000 eggs), were also liberated in the same centres. Six months after the first liberation minute searches were made in the colonised centres, no insect has yet been discovered. It is too early to give an explanation to this state of affairs ; the winter and dry season together with the role of predators like birds, ants, spiders might in this connection be responsible. In presence of the result so far obtained in the field a small experiment was carried out at Réduit. Over 800 Physonota larvæ of the first instar were placed on a Cordia plant in the field. The plant was covered with a large breeding cage so as to discard the role of insectivorous birds. Twenty-four hours after the exposure of the larvæ on the Cordia plant it was found that only 25 larvæ were remaning, the remainder was found to have been eaten by the fire ant *Solenopsis geminata F.* which was at that time abundant on that plant. The same results were obtained in two other places in the field. Larvæ placed on Cordia plants could not be traced 7 days after their exposure, in all cases red ants were attending the plants. These preliminary results are not very encouraging and further extensive searches will be made on the role of the various predators which might limit the development of Physonota in Mauritius.

The biology of *Physonota alutacea* was studied in the laboratory. The following table shows the results—

Months	Stages			
	Eggs	*Larval*	*Pupal*	*Total*
June to July ...	13–16	33–39	13–14	59–69 days
August to September ...	22–24	35–40	16–19	73–83
October to November ...	6	20	6	32

It would appear from the above that there is a marked decrease of activity of this insect during the winter period June September (temperature averaging: 24·5 C). Furthermore it was found that the hatching of the eggs was extremely low during July to September, only 5 per cent. of the eggs hatched ; this gradually increased to 50 per cent in October November and rose to nearly 100 per cent. in May–June.

The second insect imported was another phytophagus Chrysomelid beetle identified as *Schematiza cordiæ* Barber.

The first shipment of live individuals was received on 7th July. On 65 full grown larvæ sent only 8 live beetles were obtained. From June to September 13 shipments were received. The total number of insects sent as pre-pupal and full grown larvæ amounted to 5,269. Out of these 5,021 live adult beetles have been obtained. The breeding of this insect in the quarantine insectarium was easily carried out. From July to December over 9,000 adults have been obtained. Feeding tests with this insect were carried out under the same lines as for Physonota. On a total of 87 plants of economic importance tested, it was found that Schematiza larvæ and adults fed readily on two species of Cordia viz: *Cordia abyssinica* and *Cordia myxa* and on another Boraginaceæ: *Ehretia acuminata*. Apart from these plants, Schematiza larvæ were found to feed readily on cabbage leaves. The first stage larvæ fed for a few days and some individuals reached the second stage before dying. The second stage larvæ fed readily and could reach easily the third stage before dying in the pre-pupal stage ; the third stage larvæ could complete its cycle on cabbage leaves until adults were obtained therefrom. Though it has not been possible to obtain in the laboratory 1st stage larvæ to complete in one stretch their cycle up to the adult stage on cabbage leaves, there remains a big interrogation note as to how this insect will behave if liberated in the Island. Though Dr. F. J. Simmonds of the Imperial Biological Control reports that Schematiza has not been found in Trinidad attacking cabbage plants even when these were contiguous to fields of Cordia plants infested by Schematiza, the risk of liberating this insect in Mauritius remains still very great. This important question respecting the liberation or not of this insect in the Island is now under the careful consideration of Dr. Thompson, F.R.S., and Dr. Simmonds ; both of the Imperial Biological Service. Pending a final decision a small stock of this beetle is kept breeding in the quarantine green house ; and consequently every effort is made to diminish the risk of this insect being introduced in the Island, but it is safe to record here, if anything mishappen, that there are conditions not always 100 per cent. safety which are beyond our control and always inherent to this delicate piece of work. At the time of writing over 7,000 adults have been destroyed.

The life history of Schematiza as worked out in the insectarium in Mauritius is as follows—

Months	*Stages*			
	Eggs	*Larval*	*Pupal*	*Total*
August September ...	12-13	22-24	12-13	46-50 days
November	7- 8	15-16	6- 7	28-31

Experiments with various Insecticides

D.D.T. and Gammexane. *(a)* Onion seeds beds infested with *Thrips tabaci* Lindl. were treated with D.D.T. at 0·5 per cent. using wettable D.D.T. powder 20 per cent. Five days after treatment, the population of Thrips was reduced to an insignificant figure. In all treated plots, the planters concerned reckoned a better yield than in the untreated ones. No reliable figure of yields could be obtained.

(b) A 20 per cent. D.D.T. wettable powder was also used at the rate of 0·1 per cent D.D.T. against bean fly: *Melanoagromyza phaseoli* Coq. The results showed that the percentage of plants attacked in treated and untreated plots is of the range of 9 to 89 respectively.

(c) Gammexane in the form of Wettable Agrocide was used at the rate of 0·1 per cent gammexane against the bean fly as above. In this case the control plots resulted in 89 per cent. of plants attacked against only 1 per cent. in the treated plots. The wettable D.D.T. powder had no effect on the bean leaves whilst the Wettable Agrocide at the above strength had a marked scorching effect, followed by a severe distortion of the bean leaves (2nd and 3rd leaves).

(d) Gammexane in the form of Agrocide 7 was tried against cutworms *(Prodenia* and *Spodoptera)*. A bait composed of 4 kilos of wheat bran mixed with 20 grams Agrocide 7 was applied at the base of the potato plants. Fifteen days after the application no trace of cutworm could be found in the field previously heavily infested. Another bait composed of 300 grams Agrocide 7 in 3,500 grams maizebran was tried against the mole cricket *Gryllotalpa africana*. The bait was broadcasted; 24 hours after the application, dead bodies were found in great number in the infested fields.

(e) D.D.T. and Gammexane as Agrocide 7 and Agrocide Wettable powder were applied in holes and furrows of a cane field of about one arpent, heavily infested with Clemora larvæ (infestation of the range of 65,000 larvæ per arpent). The insecticides were previously mixed with air dried soil as a divisive agent before being incorporated to the soil at the bottom of both holes and furrows. The rate of application per arpent is given hereafter. The results of the larval survey obtained four months after the application of the various insecticides were very erratic as can be found in the following table—

	DDT	*Insecticides Agrocide 7*	*Wettable Agrocide*
(a) Rate applied per arpent	14 kgs 720	76 kgs 800	24kgs
(b) Number of larvae obtained per 96 sqft : Control plots	70	62	82
(c) Number of larvae obtained per 96 sqft : Treated plots	75	36	45

In no case was a significant difference obtained between treated and control or untreated plots ; the odds were of the magnitude of 6: 1 in Agrocide 7 and 10: 1 in Wettable Agrocide. The D.D.T. treatment was absolutely erratic and inconclusive. The range of odds expected in this experiment for a significant difference in the larval population is of 20: 1.

It is contemplated to start next year a new series of experiments with more replicates of latin squares, more data will then be available for a better interpretation of the results.

(f) Another series of experiments against Clemora larvæ were carried out with paradichlorobenzene (P.D.C.B.) dissolved in equal weight of Carbon disulphide. The fumigant was injected on 1/10 arpent at a depth of 4 inches and the distance between each injection was of 15 inches apart. The mean dose of insecticide per stroke of a Danker improved Carbon disulphide injector was 5 c.c. The injections were made on both sides of the stool as well as in the interlines of the cane field. The quantity of mixture used per arpent amounted to 200 litres i.e., about three times the quantity required if only both sides of the stools were injected at 15 inches apart and not the whole area. Twelve days after the application a larval survey was made in the treated and control plots. The following shows the results—

(a) Mean number of Clemora Larvae obtained in control plots per 100 square feet	114
(b) Mean number of Clemora Larvae obtained in treated plots per 100 square feet	86

On analysing these figures obtained in twelve diggings each it was found that the odds are of the magnitude 114: 1: this figure is very highly significant, the range expected for a significant difference is 20: 1. The dose applied is relatively heavy, it remains to know if the amount spent for this treatment will be recuperated by the increase in yield per arpent if any. This figure could not be worked out, the cost of these insecticides and the yield are not available at the time of writing.

Miscellaneous

(a) Shipments of coccinellids to Bermuda

At the request of Dr. W. R. Thompson, F.R.S., Director of the Imperial Bureau of Biological Control, two coccinellids *Lindorus lophanthæ* Blaisd. and *Chilocorus nigritus* Muls. were sent by the air mail service to Bermuda. These coccinellids were requested for furthering the control of the two scales, viz., *Diapis visci* and *Lepidosaphes newsteadi* which were reported to threaten the Cedar plantation of Bermuda. From 1st May to 7th August, over 51,000 *Chilocorus nigritus* and 8,000 *Lindorus lophanthæ* were sent to Bermuda in seven consignments. Dr. Thompson has since reported that 40 per cent. of these coccinellids were received alive after the transit by air of 11 to 14 days from Mauritius to Bermuda. The shipments were carried out in wooden boxes $9'' \times 8'' \times 16''$ weighing from 1 kilo 500 to 2 kilos per box. Each box was ventilated and provided with small feeding sticks containing sugar and honey in a paste form. The cost per insect collected and shipped amounted to three cents.

(*b*) Diesel oil emulsion for red ants was prepared during the year and offered for sale to the public. A certain quantity of meta bait for the control of snails was also prepared and offered for sale to the small planters and the general public. The 'Pyrex' sale was rather slow owing to the large range of insecticides with DDT now on the market.

(*c*) Lectures to students of the College of Agriculture were delivered during the year by the Acting Entomologist and Acting Assistant Entomologist, in Entomology and Zoology respectively. As usual, visits were paid to all planters concerned and advices, together with practical demonstrations on the control of insect pests, were given whenever possible.

(*d*) No meeting of the Timber Investigation Committee occured during the year; the appointment of a Timber Investigation Officer is now under consideration.

Acknowledgment

It is with the deepest sense of gratitude that the writer wishes to record here the unceasing help he received from all officers of this Division; their ever ready co-operation in all the sections above mentioned is here gratefully acknowledged.

A. MOUTIA,
Acting Entomologist.

Appendix 8

Chemical Division

1. Aloe Fibre

INVESTIGATION WORK

The main feature of interest was the visit of Messrs. G. W. Lock and F. W. Lees two experts appointed by the Colonial Office to enquire into the industry. During their stay in Mauritius, they were assisted by Mr. E. Haddon, who, as the officer in charge of the research work on aloe fibre, fully informed the experts of all the investigations previously undertaken by this Division.

In order to compare the efficiency of the automatic decorticators (three types are now actually in use in the island) with the ordinary raspadors, leaves of Furcræa gigantea, collected from the same place (Richeterre), were scraped accordingly; the following results were obtained—

Type of Decorticator	*% Total Fibre in leaves*	*% Extraction*	*Efficiency of machine expressed as Kilos of leaves treated per day (8 hours)*	
Small Raspador	4·95	95·37	3,823	
Large Raspador	2·99	97·56	4,200	
Automatic Decorticator A ...	4·95	97·25	4,800	(butt of 5" discarded)
,, B ...	2·59	74·78	22,694	(butt of 8" discarded)
.. C ...	3·52	81·05	27,000	

The influences of light on the fibre content of the leaves was determined. Leaves from plants grown under shade or fully exposed to sunlight and collected from different parts of the island, were decorticated by the same raspador, the following results expressed as per cent. of *total* fibre in leaves were obtained—

Locality	*Plants exposed to sunlight*	*Plants under shade*
Yemen	3·00	3·21
La Chaumière	3·56	3·39
Petit Verger	3·01	3·25
Riche Terre	4·25	2·91

It may be concluded from above, that sunlight has no influence on the fibre content of aloe fibre leaves.

2. Tobacco

The selection experiment was continued at Réduit Experimental Station. Leaves collected from plants obtained from selected seeds have again shown an improvement in their sugar content. The seeds from the plant having shown the highest sugar content (14·90 per cent.) were again sown in December.

Various generations of hybrids obtained at Richelieu Tobacco Research Station from the crossings of Rg. (a black-shank resistant cigar wrapper variety from Florida) with locally established varieties were examined.

The sugar content of hundred samples was determined the figures which vary from 3·30 per cent. to 18·80 per cent. average 10·62 per cent.

3. Artilcial Ageing of Rum

During the natural aging process, the constituents of rum undergo chemical change. Aging of spirits involves oxidation, it is therefore this reaction which was attempted to hasten by the following methods—

(a) oxygen was simply bubbled through rum ;

(b) the same gas was passed through a mass of teak chips over which a counterflow of rum was maintained. The length of time of contact of the oxygen with the rum was made to vary by increasing or decreasing the speed of the flow ; this was done in order to vary the extent of " aging " ;

(c) ozone was also used for the same experiments.

The above experiments showed definitely that aroma of local rums can be improved by artificial treatments ; the importance of the presence of teak wood during the oxidation process was well proved.

Another process was tried by passing a high tension electric discharge through the spirits. All these methods were, however, tantative and a *mise au point* is necessary.

4. Water

The following figures show the variations in the chemical composition of the water used as boiler feed water by a factory collected from two important springs situated in the northern districts, compared with the water supplied by the Nicolière Reservoir. Figures are expressed as parts per 100,000.

	Spring No. 1	*Spring No. 2*	*La Nicolière*
Silica as (SiO_2)	5·05	8·35	2.87
Calcium as CaO	4·28	1·20	2.40
Magnesium as MgO ...	4·00	3·06	3·80
Iron and Aluminium ...	traces	traces	practically nil
Sulphates as $CaSO_4$ ...	1·97	6·03	8·10
Chlorine as NaCl	4·70	4·70	3·50
Temporary Hardness ...	10·70	11·30	2.60
Permanent Hardness ...	5·8	7·0	7·0
Ph Value	7·6	7·1	7·4

5. Essential Oils

(a) Vetivert Oil. A series of distillations of vetivert roots collected from Black River district Yemen) and Plaine Wilhems (Roches Brunes) were performed using different techniques of distillation. In all cases the amount of oil collected were found negligible.

(b) Patchouli Oil Samples collected at Vacoas where the plant thrives well, were distilled and give an average yield of oil of 2·4 per cent. which is satisfactory.

6. Tung Oil

A sample of tung oil seed collected at Abercrombie has shown an oil content of 42·25 per cent. An examination of the extracted oil showed the following characteristics—

Specific gravity at 15·5°c ...	0·9347
Saponification value... ...	184·8
Iodine value	130·5
Acid value	8·8
Refractive index at 20°c ...	1·4979
Acidity % as oleic acid ...	4·43

7. Tea

A series of analysis was performed to determine the chemical composition of the tea produced locally. Samples were received from all the manufacturers and the following figures were obtained—

Factory	*Moisture %*	*Total ash %*	*Insoluble ash %*	*Soluble ash %*	*Alkalinity as % K_2O*	*Thein %*
A. Extra	9·32	5·32	1·43	3·89	1·71	2·75
A. Golden Pekoe	9·88	4·74	3·18	1·56	1·54	2·34
A. Dust	10·08	5·58	1·15	4·43	1·67	2·33
B. Golden Pekoe	11·00	5·06	1·39	3·67	1·60	2·48
B. Fennings...	9·64	5·65	2·09	3·56	1·74	2·85
B. Vanille Tea	9·64	5·14	1·50	3·64	1·71	2·78
C. No. 1	9·47	4·70	1·21	3·49	1·82	2·08
C. No. 2	9·25	5·80	2·22	3·58	1·75	2·65
C. No. 3	9·96	5·64	2·07	3·56	1·95	2·17
D. 1st Grade	10·06	4·59	1·18	3·41	1·70	—
D. 2nd ,, ...	10·03	5·26	1·74	3·52	1·85	—

8. Milk

The analysis of samples of milk from the Government Dairy was performed as usual. The sampling was performed in January, May, August and December.. The average figures are satisfactory.

	Total Solids	*Fat*
Morning	12·24	3·5
Evening	13·36	4·6

Routine Analysis. 243 samples were received involving 528 determinations, this shows a marked increase in the number of analyses performed when compared with previous years.

Miscellaneous. A certain amount of work was performed for the Forest Department in connection with the moisture content of mahogany wood. The Chemist remained in charge of fertilizer distribution.

As usual courses in Agricultural and Organic Chemistry were delivered during the year to students of the College of Agriculture by the Chemist and Assistant Chemist, respectively, the Scientific Assistant acting as Demonstrator in Practical Agricultural Chemistry.

Plants inspections were carried out once every fortnight at Plaisance airfield by the Scientific Assistant.

Mr. E. Haddon was in charge of the work in connection with the Aloe Fibre investigation.

R. Lincoln,
Chemist.

Appendix 9

Veterinary Division

HEAD I

A. Disease Control

1. Field Operation

Trypanosomiasis. The usual assistance given to Breeders in general was effective and no case of this disease was detected during the year. 4,800 blood smears, taken in 1,240 localities, were examined with negative results.

Tuberculosis. Thirty-one milch animals undergone P.P.D. Weybridge tuberculin test: 1 Friesland bull belonging to Government and thirty cows belonging to Estates. Two cows reacted and were slaughtered immediately.

Wire Worms. At the request of Managers of Estates and Owners of goats and sheep, 15 localities were inspected and 410 animals were found infected. They were treated successfully with N.C.A.

Warts. Seven milch calves affected with warts were subjected to treatment and completely cleaned.

External Parasites. Animals, bovines and ovines, have been severely attacked by ticks in centres where no dipping tanks exist ; after spraying with D.D.T. and " Vitix " the animals were freed from these parasites.

2. Research Operation

Abortion. Cows and senior heifers of the Government Dairy continued to receive the antistreptococcic vaccine. Only one case of abortion was recorded ; it occurred very late in December and the report of the Bacteriological authorities as to causative organism had not been received by the close of the year.

B. Animal Husbandry

1. Field Operation

Herd Animals. Interest in the breeding of draft and beef animals in grazing herds is generaly fading away, and the desirability of utilizing fodder supplies for milch cows is gaining ground. With the exception of the small breeds at the Government Breeding Centre, breeding herds are not progressing on the whole.

Milch Animals. Two new service stations were established during the year and the pure bred Friesland Bulls used at all Stations were in great demand generally, the number of services being unsatisfactory at two centres out of twelve.

The number of cows served was close on 1,000—exactly 992.

2. Research Operation

Palmar Breeding Centre. Progress has been steady at this Centre and the total number of head has increased from 48 to 64 during the year. The condition of the herds was satisfactory as well as that of pastures.

Artificial Insemination. No further progress was recorded during the year, various items of the required appliances ordered from England having not yet been received. " Artificial " progeny previously born have progressed remarkably well and the bulls at least are expected to start service in a few months time.

C. Improvement of Marketing of Animals and Animal Products

1. Castration

The castration of 56 bulls and 83 goats was performed during the year as demonstration to breeders.

2. Slaughtering of Milch Animals

1,987 permits were issued during the year for the slaughtering of cows and heifers found unfit for breeding purposes.

3. Importatoin for Meat Purposes

From Madagascar	... ...	6,942 bullocks
Australia	... ...	350 sheep
Rodrigues	... ...	451 bullocks
,,	... ...	2,932 pigs
,,	... ...	3,655 goats
,,	... ...	1,942 sheep
Agaléga	... ...	2 turtles
St. Brandon	... ...	59 turtles

4. Importation for Racing Purposes

From South Africa ... ... 12 horses

5. Importation for Breeding Purposes

From Australia ... .. 4 sheep

" ... ... 4 goats

6. Importation for Draught Purposes

From Agalega ... ... 5 mules
Diégo Garcia ... 1 colt
... ... 16 donkeys

7. Visit to Abattoirs

Surprise visits were made in all abattoirs of the Island. The seizure of six carcasses of Madagascar bullocks in 3 abattoirs for cachexia was maintained and the 3 carcasses were destroyed.

In connection with abattoirs, it should be noted that under the Chairmanship of the Veterinary Officer a Committee was appointed during the year to consider methods of slaughtering employed in local abattoirs in order to alleviate cruelty if any and to make recommendations to achieve this purpose.

The committee has submitted its report which at the end of the year was still under consideration by Government.

D. Veterinary Education

Courses on Animal Husbandry, Anatomy and Physiology of farm animals and Veterinary Pathology were given at the Agricultural College to students of the 1st, 2nd and 3rd year, by the Veterinary Officer and his Assistant.

HEAD II

Quarantine

1. Réduit Kennel

The three bitches which had arrived in the previous year have completed their six months quarantine and handed over to their respective owners in good condition of health.

2. Fort William Quarantine Station

At the beginning of the year 5 rams and 67 ewes were placed in quarantine there and delivered to their owners after some days observation.

Four race mares were placed in observation at the Station pending their exportation to the dependencies for breeding purposes.

F. E. Lionnet,
Veterinary Officer.

Appendix 10

Government Dairy

Yield of Milk

Supplied to customers	69,453 litres
Fed to calves	6,076
Samples for analysis	11
TOTAL ...	75,540

Births

Twenty-nine calves were born during the year: ten males and nineteen females.

Sales

Fourteen calves were sold: eight males and six females. In addition, five adult cows were sold by tender to butchers on account of old age or unproductivity.

Deaths

Three animals died during the year: two old cows from congestion of the lungs as a sequel of paralysis due to rheumatism, and a senior bull from pericarditis.

Abortion

Only one case was recorded.

Tuberculosis

No tuberculin test was performed during the year to eliminate the sensitization factor.

Y. LEFEBURE,
Officer-in-charge,
Government Dairy.

Appendix 11

Tobacco Research Station

The chief difficulties with which the work of the Station was faced during the year under review were unfavourable climatic conditions, a reduced staff, and the lack of suitable phosphatic fertilisers. The programme of work comprised seed-bed, field and fertiliser experiments and plant breeding: some appreciable progress was accomplished in these subjects as described further in this report.

Climatic Conditions

Except for the months of January and February, drought conditions prevailed throughout the year which was the driest recorded during the past ten years.

The meteorological statistics for the year are as follows:—

RAINFALL

Months	No. of rainy days		Inches	
	1947	Mean 1939–46	1947	Mean 1939–46
January	17	9·9	4·64	4·54
February ...	12	12·6	4·24	6·37
March	6	12·2	·60	7·27
April	13	9·1	·93	4·51
May	8	8·0	·43	1·67
June	13	7·5	1·09	·89
July	8	9·4	·49	1·26
August	9	8·7	·50	·53
September ...	3	6·9	·44	·75
October	1	3·4	·07	·72
November ...	3	6·5	1·25	1·88
December ...	12	9·6	1·66	5·48
TOTAL ...	105	103·9	16·34	35·88

TEMPERATURE (FAH.)

	Mean		Absolute		Mean Relative Humidity %
	Max.	Min.	Highest	Lowest	
January	85	73	89	71	68·3
February ...	85	78	89	70	65·1
March	84	78	88	67	68·6
April	83	76	87	67	66·6
May	81	74	84	64	63·0
June	79	69	80	60	67·4
July	77	70	80	62	62·6
August	75	68	79	61	66·0
September ...	76	69	81	60	62·8
October	79	73	84	65	56·7
November ...	86	74	86	65	56·9
December ...	84	77	88	67	63·6
TOTAL ...	81	73	89	60	64·0

Staff

The post of Government Tobacco Officer remained vacant. The work of the Station was supervised by the Director of Agriculture and the Officer-in-charge, Sugarcane Research Station who, later, was sole in charge as Acting Director of Agriculture. Two Research Assistants and one clerical assistant were on duty throughout the year and the post of one Junior Research Assistant was abolished at the end of January 1947.

Seed-bed Experiment

Further experiments were conducted during the year in an effort to determine the most satisfactory method of producing early, healthy and vigorous seedlings. These experiments consisted chiefly of—

(i) Manurial Experiments.
(ii) Fertiliser Experiments.
(iii) Semihot bed versus cold bed.
(iv) Experiments with the dust fungicide 'Folosam' for the control of damping off disease (Pythium de Baryanum, Bary) (Rhizoctonia solani, Zuhn).
(v) Experiments with gammexane—a mixture containing the gamma isomer of benzene hexachloride—for the control of red ants *(Solenopsis geminata)*.

(i) Manurial Experiments in Seed-beds

1945 and 1946 trials had indicated that the use of well decomposed compost has a marked beneficial effect on the growth of seedlings. In 1947 various mixtures of compost, cow and goat manure were tried so as to determine the most suitable mixture. The mixtures were applied at the rate of 10 tons per acre on the surface of the bed and were either mixed or unmixed with the top inch of the soil. The results are shown in the following table which shows both the number of seedlings of transplantable size raised and the number of days after which the first seedlings become available in the different treatments.

Seed Box No.	TREATMENT: Source of organic matter	TREATMENT: Method of application	Total No. of transplantable seedlings raised	No. of days after sowing from which the seedlings were available
1	Control	... ...	118	69
2	Compost	Mixed with top soil	221	55
3	Compost	Unmixed ...	310	49
4	Cow manure ...	Mixed	428	48
5	Cow manure ...	Unmixed ...	483	54
6	Goat manure ...	Mixed	392	47
7	Goat manure ...	Unmixed ...	253	47
8	Compost and Cow manure ...	Mixed	180	47
9	Compost and Cow manure ...	Unmixed ...	316	47
10	Compost and Goat manure ...	Mixed	604	45
11	Compost and Goat manure ...	Unmixed ...	377	45
12	Cow and Goat manure ...	Mixed	190	48
13	Cow and Goat manure ...	Unmixed ...	219	49
14	Compost, cow and goat manure ...	Mixed	464	48
15	Compost, cow and goat manure ...	Unmixed ...	190	47

The above experiments were carried out in seed-boxes; afterwards a larger scale experiment was arranged in three seed-beds 25′ × 4′ with the treatments randomised and replicated thrice. The seedlings, however, were heavily infested with nematodes so that no reliable results were obtained.

(ii) Fertiliser Experiment in Seed-beds

These experiments were devised to test the effect of various levels and various methods of application of fertilisers on the growth of seedlings. The standard mixture applied consisted of one kilogramme of a 16-40-6 mixture in the form of Sulphate of Ammonia, phosphatic guano and potassium sulphate. Mixtures containing twice the amount of phosphatic guano or potassium sulphate and twice or three times the amount of ammonium sulphate, and combinations of these, were compared with the standard. The fertilisers were either sprinkled on the surface or mixed with the top inch of the soil. No difference was observed between the various treatments in the growth of the seedlings, except that the mixture containing three times the amount of nitrogen proved slightly toxic to the young seedlings.

(iii) Semi-hot Bed versus Cold Bed

A bed 25′ × 4′ was dug to a depth of 15 inches. A 1-foot layer of dry corn stalks and grass was placed at the bottom of the bed and a 9 inches layer of soil on the top. The bed was lined with two courses of bricks and the surface was finished with a layer of compost one inch thick. The cold bed was prepared similarly except that no filling of corn stalks or grass was used. Germination was earlier in the first bed and the seedlings were more uniform, vigorous and rapid in growth, with the result that 10,500 seedlings of transplantable size were available in 35 days from the first bed whereas only 6,300 seedlings had been removed from the second bed in 45 days.

(iv) ' Folosam ' Experiment

A preliminary trial was started to compare the effect of the fungicide ' Folosam ' provided by the Plant Pathologist with that of Cheshunt Compound in the control of damping off disease in seed-beds. Four beds were treated as follows—

(a) Cheshunt compound applied before sowing and at intervals after germination.

(b) Folosam applied at intervals before germination.

(c) Cheshunt compound applied before sowing and Folosam at intervals after germination.

(d) No fungicide applied.

Damping off started in all beds some ten days after sowing and several applications of the fungicide were required to stop its progress. From the results it appears that although the incidence of disease was greater in the beds treated with Folosam than in those treated with Cheshunt, yet both were equally effective in controlling it. The disease increased rapidly in the control bed.

(v) Experiments with Gammexane

The results of these experiments confirmed those of the previous year, viz., that gammexane is greatly superior to all the insecticides previouly used. As regards the method of application the following had been found to give the best results: Apply 500 grams of the mixture containing 0·2 per cent. gammexane along the perimeter of the bed inside the brick lining on the day prior to sowing and 150 grams daily afterwards until the seed has germinated.

Fertiliser Experiment

The manurial and Phosphate Experiment. This experiment was planned to test the effect of three sources of organic fertilisers—compost, a mixture of cow and goat manure and a control—and two sources of phosphatic fertilisers—phosphatic guano and precipitated phosphate—at two levels 40 kgs. and 60 kgs. P_2O_5 per acre on the yield and quality of the leaf. The design was a factorial $3 \times 2 \times 2$ with three replications, each plot being 1/150th of an acre. The yield and grade index results are shown in the following tables—

Yields ± 41·0

	Phosphatic guano		*Precipitated Phosphate*		*Mean* ± *20·5*
	40kgs P_2O_5	*60kgs P_2O_5*	*40kgs P_2O_5*	*60kgs P_2O_5*	
	per acre	*per acre*	*per acre*	*per acre*	
Control	238	310	529	510	397
Compost	314	254	475	526	393
Manure	312	319	385	479	373
Mean	288	294	463	505	388
±23·6					±11·8
Mean	291		484		
±16·7					

Grade Index ± 13·2

	Phosphatic guano		*Precipitated Phosphate*		*Mean* ± *6·6*
	40kgs P_2O_5	*60kgs P_2O_5*	*40kgs P_2O_5*	*60kgs P_2O_5*	
	per acre	*per acre*	*per acre*	*per acre*	
Control	369	414	418	447	412
Compost	401	397	440	423	415
Manure	421	418	445	446	432
Mean	397	410	434	439	420
±7·6					± 3·8
Mean	403		437		
±5·4					

From the above tables it will be seen that—

(i) precipitated phosphate has given significantly higher yields and better grade of leaf than phosphatic guano ;

(ii) the higher level of P_2O_5 has given a significantly higher average yield than the lower level ;

(iii) the use of manure has given a significantly better grade of leaf than the control.

Plant Breeding

The object of this work is to produce a variety or strain suitable to local conditions with a flavour superior to Amarello. The latter is the variety actually favoured by the growers because it gives a higher yield and a greater percentage of bright leaf than the other varieties, but it possesses a peculiar tang which has prevented its export.

The main lines of work consisted of—

A. Test of newly imported varieties.

B. Variety Selection.

C. Crossing work and Hybrid Selection.

A. Tests of Newly Imported Varieties

Three flue-cured varieties Oxford 1, Oxford 3 and Florida 301 reported to be resistant to Black Shank (*Phytophthera nicotianæ*. Breda de Haan) (*P. parasitica* var *nicotianæ* Tucher) were received from Beltsville U.S.A. and were planted out at the beginning of the year at the Variety Trial. They showed considerable resistance to disease but their leaves cured with a pronounced greenish tinge, and the leaves of Florida 301 were very susceptible of being damaged by wind. The three varieties were subsequently planted out in the Black Shank Trial where their general behaviour was compared with that of the established varieties. Twenty-five selections were made in the new varieties and after examination of the cured leaf and of the roots only one selection was kept in each variety. Fifty four crosses were made between these varieties and nine established ones.

The varieties imported from Canada, Southern Rhodesia and India in 1946 were again tested, but none of them proved superior to the local ones. Further selections were made for testing in 1948.

B. Variety Selection

Rigorous selection for type, yield, quality and resistance to Black Shank and nematodes was continued in all the varieties planted at the Station. Some 140 selections were made in the various varieties and only 31 were retained for further tests in 1948. The selections made in 1946 were used for –

(i) the Variety Trial ;

(ii) Progeny Plots.

(i) Variety Trial

78 selections of various varieties and the three newly imported varieties were planted together with the object of testing them for yield and quality. The design adopted was the lattice square 9×9 with four replications and with plots 1/300th of an acre. The initial growth of the plants was good but a severe attack of Black Shank destroyed many of the plots and ruined the experiment.

(ii) Progeny Plots

The best selected strains of Amarello pointed leaf, of Amarello broad leaf and of the established varieties which possess a flavour superior to Amarello were planted out in the progeny plots where mass selections was carried out. The uniformity of vegetative characteristics, growth, flowering and curing properties was very noticeable in the Bonanza and Jamaica Wrapper plots. The Amarello was slow in growth and showed signs of deficiency, but a top dressing of precipitated phosphate, when supplies became available, completely changed the appearance of the whole field and the plants

developed normally. A good supply of seed was obtained and the following was sent to the Tobacco Board for distribution to planters free of charge, during the coming season—

Variety	*Quantity in kilos*
Amarello pointed leaf ...	5,750
Amarello broad leaf... ...	2,700
Bonanza	1,750
Jamaica Wrapper	1,000
Other varieties	1,550
TOTAL ...	13,350

C. Crossing work and Hybrid Selection

This work was continued on the lines laid down by Dr. Carson. It consisted of the following—

(i) Crosses between the varieties Bonanza and Amarello.

(ii) Crosses between Amarello and other varieties.

(iii) Hybrid Trial.

(iv) Black Shank Resistance Trials.

(i) BONANZA × AMARELLO AND *vice versa*

The hybrids Bonanza × Amarello and Amarello × Bonanza proved once more superior in grade of leaf and equal in yield to Amarello and superior to Bonanza in both. A large number of crosses between Amarello and Bonanza were therefore prepared and seed obtained for trying the plantation of these F I's on a commercial scale during 1948.

(ii) CROSSES BETWEEN AMARELLO AND OTHER VARIETIES

44 crosses have been made both ways between Amarello and some established varieties which possess a flavour much superior to Amarello for the purpose of testing the F I's for yield and quality during 1948.

(iii) HYBRID TRIAL

At the beginning of the year a large number of hybrids had accrued as a result of crossings, selections and back crossings made in the preceeding years. In order to eliminate the greater number of them and to keep only the most promising for further work, a Hybrid Trial was conducted. In this trial 96 selected hybrids and 4 parent varieties were planted out and tested for yield, quality and resistance to disease. The design adopted was the lattice 10 × 10 with four replications and plots of 1/300th of an acre.

From the beginning of the experiment the hybrids of Amarello blood were easily distinguishable from the others, being much more vigorous. Notes were taken weekly on the general behaviour of the various hybrids, particularly with regard to the vegetative characters, segregation into types and resistance to disease. Eight of the fifth generation hybrids were noticeable for their good performance in the field and for the uniformity of their vegetative characters.

Several selections were made in each of the best hybrids and the performance of each selection was recorded. The best selection in each hybrid was kept after an examination of the roots and of the cured leaf. A final choice between the hybrids was possible based on the yield and grade index figures.

The following hybrids were homozygous in so far as vegetative characters were concerned—

Designation	*Generation*	*Adjusted values*	
		Yield Kgs per acre ± 59·1	*Grade Index ± 15·8*
X 4–41–1– 2– 2 – 1 ...	F 5	368	371
X 5–41–2– 2– 3 – 5 ...	F 5	385	338
X 4–42–5–21– – – – ...	F 3 of back cross	250	296
X 4–42–5–12– 2 – – ...	F 4 ,,	368	342
X 6–42–1– 3– 1 – – ...	,,	416	337
X 6–42–1– 3– 3 – – ...	,,	405	339
X 6–42–1– 3– 4 – – ...	,,	467	362
X11–42–1– 1– 3 – – ...	,,	412	341
Amarello	Male Parent variety	461	336
Bonanza	Female Parent variety	224	322

(iv) BLACK SHANK RESISTANCE TRIALS

A. Black Shank Resistance Trial I

This experiment was begun in 1946. F 1 hybrids between the cigar wrapper variety Rg. which has proved to be highly resistant to Black Shank, and eight flue cured established varieties, viz., Bonanza, Jamaica Wrapper Virginia Bright, White Mammoth, Yellow Mammoth, Amarello pointed leaf, Amarello broad leaf were planted with the 9 parent varieties with the object of testing their resistance to disease. The hybrids and their parents were randomised in two blocks, each plot being 1 300th of an acre.

The plants were inspected at weekly intervals for any symptom of disease such as wilting and the number of diseased plants in each plot was recorded. The percentage of healthy plants harvested was calculated and the results are summarised in the following table—

Mean Percentage Number of Healthy Plants Harvested

Parent variety	*% healthy*			
	Variety	*Variety × Rg.*	*Rg. × Variety*	*Hybrid Mean*
Bonanza	54·5±8·19	79·4±5·66	85·9±4·10	82·3±2·73
Jamaica Wrapper... ...	11·3	86·5±5·66	81·9±4·10	84·4±2·73
Virginia Bright	9·1	76·1±5·79	86·3±5·79	81·2±4·10
White Mammoth	29·5	86·2±5·79	82·9±5·79	84·5±4·10
Yellow Mammoth... ...	31·8	84·0±5·79	76·2±5·79	80·1±4·10
White Stem Orinoco ...	40·9	81·8±8·19	87·5±5·79	85·6±4·75
Amarello pointed	43·2	88·6±8·19	88·6±8·19	88·6±5·79
Amarello broad	75·0	*100·0±8·19	93·2±8·19	96·6±5·79
Rg.	95·4	—	—	—
Mean	43·4±2·73	83·8±1·88	84·4±1·93	84·1±1·35

*average of two plants only

From the above table the hybrids are much more resistant than the parent varieties except Rg.

The plants were uprooted on the same day after all the leaves had been harvested and the root of each plant was examined. The following percentages were assigned to the different classes of infection: trace 10 per cent., slight 20 per cent., medium 60 per cent., severe 100 per cent. and the mean percentage of infection was calculated for each plot.

MEAN PERCENTAGE NUMBER OF ROOTS INFECTED

Parent variety	*% Infection*			
	Variety	*Variety × Rg*	*Rg × Variety*	*Hybrid Mean*
Bonanza	69·8±3·33	46·1±1·49	42·5±1·66	44·5±1·11
Jamaica Wrapper	92·2±3·33	37·1±1·49	40·3±1·66	38·5±1·11
Virginia Bright	99·1±3·33	47·0±2·35	38·2±2·35	42·6±1·66
White Mammoth	85·9±3·33	45·3±2·35	49·3±2·35	47·3±1·66
Yellow Mammoth	77·0±3·33	44·5±2·35	44·7±2·35	44·6±1·66
White Stem Oricono	72·0±3·33	29·5±3·33	32·0±2·35	31·2±1·92
Amarello pointed	81·1±3·33	25·7±3·33	24·3±3·33	25·0±2·35
Amarello broad...	47·0±3·33	*0·0±3·33	25·2±3·33	12·6±2·35
Rg.	22·0±3·33	—	—	—
Mean	71·8±1·11	39·2± ·76	39·4± ·78	39·3± ·55

*average for two plants only.

From the foregoing table it is evident that the root infection of the hybrid is greater than that of Rg., but considerably less than that of the parent varieties.

The second and third primings were cured and from the yield results the Amarello hybrids are much the heaviest yielders. The cured leaf of all the hybrids had a slight greenish tinge.

A number of selections was made in each plot, and later the best selection was kept. A new lot of crosses was made between Rg. and other varieties, and each hybrid was back crossed to its female parent.

B. Black Shank Resistance Trial II

26 F I hybrids between Rg. and thirteen flue cured varieties the 16 F 2 and the 16 1st progeny of back crosses from the preceding trial, 14 parent varieties and three new varieties were planted in this trial so as to compare their reaction to Black Shank.

The experiment was planted in a lattice design 8 × 9 with four replications each plot being 1 300th of an acre. The incidence of disease was recorded as in the previous experiment and the results are shown in the following table—

TABLE OF ADJUSTED VALUES OF MEAN PERCENTAGE NUMBER OF PLANTS HARVESTED ±6·5

% harvested

Parent Variety	*Variety*	*F I*		*F II*		*1st progeny of back cross*		*Hybrid Mean*
		V × Rg	*Rg × V*	*V × Rg*	*Rg × V*	*V × Rg × V*	*Rg × V × Rg*	±2·6
Bononza ...	67	93	94	92	87	82	96	91
Jamaica Wrapper ...	72	97	99	92	94	92	99	96
Virginia Bright ...	80	99	96	97	93	96	92	95
W. Mammoth ...	66	100	96	93	97	98	97	97
Y. Mammoth ...	64	98	100	92	96	97	95	96
W. S. Orinoco ...	74	96	95	93	91	91	94	93
Amarello pointed ...	69	100	96	95	93	94	98	96
Amarello broard ...	87	97	100	92	91	88	92	93
W. Amarello ...	—	89	89	—	—	—	—	89
W. Stem Pearl	72	95	100	—	—	—	—	97
W. Stem Willow leaf ...	65	98	100	—	—	—	—	99
Hickory Prior ...	—	89	95	—	—	—	—	92
Yellow Prior ...	—	94	84	—	—	—	—	89
Oxford /1 ...	88	—	—	—	—	—	—	—
Oxford /3 ...	94	—	—	—	—	—	—	—
Florida 301 ...	95	—	—	—	—	—	—	—
Rg.	99	—	—	—	—	—	—	—
	78	96	96	93	93	95	95	94
	±1·7	±1·8	±1·8	±2·3	±2·3	±2·3	±2·3	±1·8

From the above table it is evident that the number of plants harvested is greater in the hybrids than in the parent varieties except Rg. There are also considerable differences between the various hybrids.

The percentage of root infection was also calculated as in the previous experiment and the results are shown hereunder—

TABLE OF ADJUSTED VALUES OF MEAN PERCENTAGE OF ROOT INFECTION ± 4·1

Parent Variety	*Variety*	% *Infection*						
		F I		*F II*		*1st progeny of Hybrid back cross*		*Mean* ±1·7
		V × *Rg*	*Rg* × *V*	*V* × *Rg*	*Rg* × *V*	*V* × *Rg* × *V*	*Rg* × *V* × *Rg*	
Bonanza ...	92	80	78	76	82	83	68	78
Jamaica Wrapper ...	89	73	75	64	74	75	58	70
Vir. Bright ...	81	63	68	60	80	82	47	67
W. Mammoth...	95	67	66	70	74	82	49	68
Y. Mammoth ...	92	71	66	80	64	80	57	70
White Stem Orinoco ...	89	77	75	66	79	92	61	75
Amarello pointed ...	37	7	6	22	27	21	34	20
Amarello broad	42	12	24	39	38	33	27	29
W. Amarello ...	—	88	91	—	—	—	—	89
W. Stem Pearl	100	77	75	—	—	—	—	76
W. Stem Willow Leaf ...	96	71	69	—	—	—	—	70
Hickory Prior...	—	82	76	—	—	—	—	79
Yellow Prior ...	—	77	93	—	—	—	—	85
Oxford /1 ...	63	—	—	—	—	—	—	—
Oxford /3 ...	73	—	—	—	—	—	—	—
Florida 301 ...	49	—	—	—	—	—	—	—
Rg.	22	—	—	—	—	—	—	—
	73 ±1·1	65 ±1·1	66 ±1·1	60 ±1·5	65 ±1·5	69 ±1·5	50 ±1·5	63 ±1·1

(V Means Variety).

From the foregoing table it is evident that the hybrids, particularly the Amarello hybrids, have shown less root infection than the varieties, except Rg. Highly significant differences exist between the various hybrids and varieties ; of the three new varieties, Florida 301 seems to be the most resistant to Black Shank.

The Amarello hybrids have given significantly higher yields and grade of leaf than the others.

Samples of leaves of the various selections were forwarded to the, Chemical Division for determination of total sugar content. Fairly high percentages of sugar were found in many samples with considerable variations in the various strains.

Air Curing Experiment

Several air-curing varieties were planted out in this experiment so as to test the yield and quality of the cured leaf. A severe attack of mildew (Oildium tabaci) reduced considerably the yield and grade of the leaf. A number of selections were made in the varieties and some were crossed with the cigar wrapper variety Rg. for testing in 1948.

Curing Experiments

These experiments were conducted in an effort to determine the optimum conditions of temperature and humidity for flue curing. Two barns were fitted with a hydrograph, thermometers and hygrometers were placed on the various tiers and readings were made at regular intervals during the curing process. Some information was obtained on the conditions prevailing in the barn and their effect on the curing of the leaf of the different varieties.

Rotation Crops

More fields were planted with sugarcanes in rotation with tobacco. The cultivation of this crop provides a large amount of organic matter in which the soils of Richelieu are deficient and a dense shade which has already proved successful in partially controlling the growth of noxious weeds, particularly chiendent *(Cynodon Dactylon)*. The other crops planted in rotation with tobacco included maize and pois mascate (*Stizolobium* sp.).

Educational

Five apprentices continued their training at the Station and were joined by three new ones, appointed by the Tobacco Board, in July. The three apprentices undergoing their third year training were sent to the tobacco estates to study other conditions of curing.

L. Suzor,
Senior Research Assistant.

Appendix 12

Agricultural Division (Rodriguez)

Climatic Conditions

RAINFALL AT OYSTER BAY

	Inches	*Rainy days*		*Inches*	*Rainy days*
January ...	12·29	19	July ...	2·34	16
February ...	10·65	8	August ...	·98	10
March ...	5·03	12	September ...	2·72	13
April ...	1·94	14	October ...	1·62	12
May ...	5·40	13	November ...	·77	11
June ...	4·09	18	December ...	1·32	11

Total amount recorded : 49·15 inches. Rainy days : 157

General Conditions

The year 1947 has been in many respects a pretty difficult one for Agriculture. Production was considerably hampered by adverse weather conditions and the general disorganisation subsequent to the four cyclones which visited the island at a week interval during the period 21st January to 14th February. The strongest occurred on the 6th of February. Wind speeds of 100 miles and over were attained during several hours. This cyclone accompanied by an extraordinary coming in tide, has caused a great deal of damage. Most of the plantations were destroyed. One police constable was drowned. The two populated localities of River Coco and Port South East suffered heavily. Buildings alongside the cost were washed away and a considerable number of fishermen's boats were either smashed, carried adrift or badly damaged. In other localities may huts were either broken or very badly damaged. A breeder at Pistache lost 27 heads of cattle most probably carried over the sea. Elsewhere, casualties have also occurred amongst the cattle, goats, sheep and pigs especially, many of these were chilled to death in their muddy sties.

The population sought assistance from Government and a considerable number of men and women have had to be employed on 'Relief Work' during several months.

A shortage of Maize seeds for the replanting out of the fields was experienced ; the available supplies at the Experimental Station could not satisfy all requirements and seeds had to be imported from Mauritius. These facts coupled with the necessity for many cultivators to seek employment as a means of subsistence or devote their activities to the rebuilding of their houses, were the cause that the sowing of the seeds was made very irregularly. The yields obtained varied considerably. The late sown plantations gave the best results. An attempt to produce a second crop was made later on, but the rainfall was inadequate with the results that only light yields were obtained.

Sweet potatoes were grown on a wider scale than the preceding years whilst Manioc showed a reduced area under cultivation, due to shortage of planting material.

Beans yielded well and satisfactory prices were obtained.

A further increase in the cultivation of Phaseolus radiatus has been observed.

The numerous cyclones experienced these recent years have contributed to a great extent to the further depletion of soil fertility in many lands that were already bearing the mark of erosion. In the valley of Oyster Bay land slides on different areas representing 5 to 6 acres caused a loss of soil to a depth of 18 inches or more. Even those lands on which protective measures had been carried out have not been spared, many structures built up to check erosion having collapsed and the drains, filled with *débris*, having overflowed. The farmers, after the hard trials they have been through, feeling pretty disheartened have slackened their efforts towards land preservation directing all their attention to the drawing of an immediate income that would help to make up the losses they have sustained.

In the field of animal husbandry, condition have not been satisfactory either. With a few exceptions, the types of animals offered for the sale were not of the usual standard, chiefly in the case of pigs and poultry. Farmers for want of cash to supply their immediate needs, or on account of shortage of feeds, very often found themselves compelled to market half grown animals. Prices for poultry have kept pretty high but pig values dropped from R.1.00–1.10 to 60–75 cents per pound live weight.

Condition of pasture in the Cattle Walk deteriorated rapidly towards the end of the year as a consequence of the drought usually experienced during this period.

" Accacia " seeds have been widely collected whenever available. Prices varied between 8 and 9 cents per pound.

Experimental Station

The station was in a pretty desolate condition during a certain period following the four successive cyclones and mending the damage done has claimed a considerable amount of activities and an additional expenditure of Rs. 800.

New quarters have been built for the Overseer by the Public Works Department. The Overseer has been living at Oyster Bay since the beginning of August.

The Agricultural Officer's quarters have been provided with a septic tank.

The two solar propagators have been rebuilt anew.

Varietal experiments were continued with different varieties of Maize, Manioc and Yams. Many other species of food crops were also grown and planting material made available for distribution to local growers. Vines of certain varieties of sweet potatoes formerly grown at the experimental station were obtained from different farmers and replanted with a view to obtaining planting material for the production of new varieties in due course.

The roots of the bread fruit plants which had their shoots broken by the cyclones were replaced in the solar propagators. About 50 per cent. have produced new suckers.

435 roots were imported from Mauritius and placed in the two solar propagators.

18 avocado pears, 18 bread fruit, 13 mango, 29 lemon (Messina), 7 orange (Jaffa), 40 guava, 4 raphia and 2 peach plants have been planted in the orchards and around the Experimental Station.

Scions of different varieties of Peach and Mango to be grafted on local stocks were imported from Mauritius. 3 peach grafts have been successful.

Distribution of Planting Material

3,185 lbs. of maize seeds to 560 persons. 68 bread fruit plants to 61 persons. 37 guava, 30 papaw (solo), 9 avocado pear, 18 lemon (Messina), 1 peach, 6 orange, 4 mango, 150 ornamental shrubs were distributed amongst 24 persons. Vegetable seeds and seedlings to 13 persons. Tobacco seeds to 6 persons. 4,636 manioc cuttings to 142 persons.

Stock Farm

Necessary repairs were made to the buildings, fences, etc., damaged by the cyclones. The pasture grounds were maintained in good condition.

Two new poultry houses with partitions and wire netted runs have been built.

Cattle

Cross-bred Friesland

Birth. 2 bull calves.

Present number. 2 cows, 2 bull calves.

Afrikander

Birth. 1 heifer that died 2 months later.

Present number. 1 cow.

Ticks have been troublesome. Tick grease was applied and dipping the animals in the sea during the spring tides brought some relief. "Gamatox" dip has been ordered for.

Pig

Large Black and Large White

Sold. 1 sow for Rs. 387.50.

Present number. 1 boar.

Number of services. 44.

Donkey

Catalonian

Birth. 1 jenny foal.

Present number. 3 jacks. 5 jennies.

Poultry

Turkey American Bronze

Sold. 17 cocks, 7 hens and 112 eggs for Rs. 366.58.

141 eggs placed under broody hens have produced 74 chicks of which 40 died.

Present number. 3 cocks, 6 hens and 34 chicks.

Chicken Rhode Island Red

Eggs imported from Mauritius in December 1946, and June 1947, have produced 10 birds—(4 cocks and 6 hens) and 8 chickens.

The old stock of birds consisting of 4 cocks and 10 hens was sold for Rs. 91.75.

410 eggs were sold. 21 placed under broody hens were all unfertile, due most probably to the fact that the cock placed with the hens was too young.

Land Tenure

Considerable time has had to be devoted to the question of land tenure. Settlements of dispute, control on encroachments on lands, visits to be paid to areas applied for to be leased before recommendations are made have been the main activities of the Agricultural Officer.

Satisfying the increased demands for land settlements from a rapidly growing up population is one of the most serious problems Government is facing at present.

After the necessary inquiries have been made, the position reveals itself as follows:

There exists 250 people who are in urgent need of one acre of land, they are presently struggling to find a living on their parents' land and are all longing for their independence.

100 lessees of one acre of land are all anxious to get another acre as the area already granted to them is not sufficient to provide food for them and their gradually increasing family.

About 400 young men, who have left in the Pioneer Corps in 1946, will have to provided with an acre of land when they are repatriated in 1949.

It can be estimated that every year about 150 men and as many girls be reaching the age of earning their living and as a consequence of the little scope for employment, they will be in need of a piece of land.

This means that 350 acres of land are immediately needed, and another 550 acres will have to be provided during the next five years.

How such a goal is to be reached is a very serious problem. Expert advice has been sought for in Mauritius.

Union Estate which has been bought by Government in 1947 is being parcelled out by the Surveyor and leases are being drawn for lands that are under cultivation. Certain areas have been passed under the control of the Forests Department as Crown Forests or Critical Areas and others are being reserved for establishment of quarters for Government Officers or other use Government might have to make of these.

About 300 out of the 400 acres have been surveyed.

Prevention of Soil Erosion

The Rs. 3,000 voted this year for the prevention of soil erosion on item Development and Welfare, have not been in fact a very substantial increase on the Rs. 1,200 provided formerly. No war bonus being attached to the above item, the labourers had to be paid higher wages (Rs. 1.00 and later R. 1.50 instead of 60 cents per diem). An amount of Rs. 6,000 to be spent up to 30th June, 1948, has been applied for.

Works were carried out at Mont Trois Soleils and Grande Montagne, and at Diamants, Oyster Bay, Bay Malgache, and Canne Paul on the newly opened lands recently leased to the ex-servicemen. Assistance was also given to 11 members of the Co-operative Credit Societies and the works were performed under the supervision of the I.C.C.S. and the Presidents of the societies.

It was unfortunate that, owing to lack of an adequate staff to control and advise on the work, it has not been possible to devote to the reconditioning of lands part of the labour available.

Agricultural Instruction

Advices on more profitable and scientific methods of Agriculture were passed on verbally to farmers whenever opportunities arose. Progress is very slow with this system of occasional teaching, but the Agricultural Officer overburdened by other duties could not devote more time to the education of the agricultural community and unless the personnel is adequately strengthened, it does not appear that considerable improvement of the position may be expected.

The Director of Education and Mr. P. Randabel of the Training College visited the Island in June and October respectively. A comprehensive programe has been laid for the training of the youths in improved methods of agriculture. The scheme covers: Creation of gardens and Rabbit and Poultry clubs in different schools and the enlistment at the Agricultural College of apprentices selected amongst the pupils who are liable to take more intelligent interest in agricultural instruction. Six apprentices were enlisted in December. The course of instruction is mainly practical. Demonstration is the chief method of instruction with short talks as required. The students are to maintain a record of their work and it is expected that after three years training they will be in a position to play leading roles as progressive farmers.

Suitable sites have been selected for the establishment of the school gardens.

Pasture Improvement

A great number of shade trees have been broken by the cyclones and many others died later on. They were handed over to the Forests Department.

The pasture under shade trees has been cleared of all broken branches. The plantation of *Terminalia arjuna* at Bay Topaz has been thinned to allow pasture grass to grow under the trees. Eucalyptus shoots growing from stumps left after the trees had been cut have also been thinned.

Breakfires have been established around the plantations of shade trees at Bay Topaz. Of the different varieties of pasture grass planted, Kikuyu proved the most resistant.

Undesirable plants were destroyed at Bay Topaz, Bay du Nord and La Ferme. In the areas where Lantana had been destroyed severe regrowth had occured. From a survey held, it appears that Lantana is well established on the west of an imaginary line extending from Port South East to Oyster Bay, and it is spreading rapidly in the Corals and in the vicinity of La Ferme. Owing to shortage of staff no active steps could be taken to control the weed.

The drinking troughs were kept in good condition. Trouble was again experienced due to unknown persons, removing the roses from the reservoir thus causing the pipes to be continually choked with mud and rubbish.

Establishment of Windbreak

1,286 bread and chees were planted at Bay Malgache to act as windbreak.

Britannia Outboard Engine

The Britannia outboard engine has been working during only four months. The torque tube inside the shaft broke due most probably to a shock received during shipment. A new tube has been ordered from the makers.

RENÉ JAUFFRET.
Agricultural Officer.

Appendix 13

Legislation

The following Ordinances, Proclamations and Government Notices were issued during the year—

Ordinance No. 5—To amend the Tobacco (Consolidation) Ordinance, 1944.

Ordinance No. 49—To amend the Sale of Cane (Control) Ordinance, 1941.

Proclamation No. 4—To amend Proclamation No. 10 of 1946, issued under the provisions of the Sugarcane Plantations (Control) Ordinance, 1945.

Proclamation No. 8—To amend Proclamation No. 10 of 1936, issued under the provisions of the Importation of Plants (Diseases Prevention) Ordinance, 1910.

Proclamation No. 13—To proclaim the rate of Export Duty leviable on the sugars of the 1946–47 crop.

Government Notice No. 106—Regulations made under Section 6 of the Registration of Agricultural Chemists Ordinance, 1944.

Government Notice No. 108—Regulations made under Sections 12 and 28 of the Sale of Canes (Control) Ordinance, 1941.

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